

COLUMBIA LIBRARIES OFFSITE
HEALTH SCIENCES RESTRICTED



HR00238112

Biennial report

SERIAL

Columbia University
in the City of New York
College of Physicians and Surgeons
Library



OCT 22 1943 DLO


COMPLIMENTS OF

THE KANSAS STATE BOARD OF HEALTH.

J. W. REDDEN, M. D.,

Secretary, and Executive Officer.

715 Kansas Avenue, Topeka.



Digitized by the Internet Archive
in 2010 with funding from
Columbia University Libraries

SIXTH ANNUAL REPORT

ON THE

STATE BOARD OF HEALTH,

OF THE

STATE OF KANSAS,

FROM

JANUARY 1, 1890, AND ENDING DECEMBER 31, 1890.

TOPEKA.

KANSAS PUBLISHING HOUSE: CLIFFORD O. BAKER, STATE PRINTER.

1891.

MEMBERS OF THE BOARD.

MEMBERS OF THE BOARD.

G. H. T. JOHNSON, M.D., PRESIDENT, Atchison Term expires March 28, 1893.
D. C. JONES, M.D. Topeka Term expires March 28, 1893.
J. MILTON WELCH, M.D. Wichita Term expires March 28, 1893.
ROBERT C. MUSGRAVE, M.D. Grenola Term expires March 28, 1892.
R. A. WILLIAMS, M.D. Olathe Term expires March 28, 1892.
W. L. SCHENCK, M.D. Topeka Term expires March 28, 1892.
H. D. HILL, M.D. Augusta Term expires March 28, 1891.
FRANK SWALLOW, M.D. Valley Falls . . Term expires March 28, 1891.
J. W. JENNEY, M.D. Salina Term expires March 28, 1891.

J. W. REDDEN, M.D., SECRETARY, TOPEKA.

COUNTY HEALTH OFFICERS.

The following is a list of the County Health Officers, and their post-office addresses, in the various counties in the State:

| <i>Counties.</i> | <i>Towns.</i> | <i>Health officers.</i> |
|------------------|-----------------------|----------------------------|
| Anderson..... | Garnett..... | John A. Henning, M. D. |
| Barton..... | Great Bend..... | S. J. Shaw, M. D. |
| Bourbon..... | Fort Scott..... | R. Aikman, M. D. |
| Brown..... | Hiawatha..... | S. M. Pratt, M. D. |
| Butler..... | El Dorado..... | J. A. McKenzie, M. D. |
| Chase..... | Cottonwood Falls..... | C. E. Hait, M. D. |
| Chautauqua..... | Sedan..... | J. L. Graham, M. D. |
| Cheyenne..... | St. Francis..... | F. K. Dabney, M. D. |
| Clay..... | Clay Center..... | S. E. Reynolds, M. D. |
| Clark..... | Ashland..... | H. S. Parks, M. D. |
| Cloud..... | Concordia..... | L. D. Hall, M. D. |
| Coffey..... | Burlington..... | Wm. Manson, M. D. |
| Comanche..... | Coldwater..... | John L. Holliday, M. D. |
| Cowley..... | Winfield..... | Geo. Emerson, M. D. |
| Crawford..... | Girard..... | Wm. H. Warner, M. D. |
| Decatur..... | Oberlin..... | W. B. Mead, M. D. |
| Douglas..... | Lawrence..... | N. S. Simmons, M. D. |
| Edwards..... | Kinsley..... | B. R. Mosher, M. D. |
| Elk..... | Grenola..... | R. C. Musgrave, M. D. |
| Ellis..... | Hays City..... | Hugo B. Kohl, M. D. |
| Ellsworth..... | Ellsworth..... | R. L. Doig, M. D. |
| Ford..... | Dodge City..... | T. L. McCarty, M. D. |
| Finney..... | Garden City..... | Geo. L. Neal, M. D. |
| Graham..... | Hill City..... | J. Ion. Ardery, M. D. |
| Greenwood..... | Eureka..... | A. T. Higgins, M. D. |
| Greeley..... | Tribune..... | F. C. Moore, M. D. |
| Geary..... | Junction City..... | P. Dougherty, M. D. |
| Garfield..... | Ravenna..... | Henry C. Suess, M. D. |
| Hamilton..... | Syracuse..... | R. C. Dryden, M. D. |
| Harper..... | Harper..... | W. G. Muir, M. D. |
| Harvey..... | Newton..... | G. D. Bennett, M. D. |
| Hodgeman..... | Jelmore..... | J. K. Miller, M. D. |
| Haskell..... | Santa Fé..... | W. T. Mills, M. D. |
| Jewell..... | Mankato..... | Walter Crew, M. D. |
| Johnson..... | Olathe..... | C. G. McKinley, M. D. |
| Kingman..... | Kingman..... | E. W. Hinton, M. D. |
| Kearny..... | Lakin..... | C. C. Lovin, M. D. |
| Labette..... | Oswego..... | E. E. Liggett, M. D. |
| Lane..... | Dighton..... | F. L. Round, M. D. |
| Lincoln..... | Lincoln..... | Henry M. Hall, M. D. |
| Linn..... | Mound City..... | T. E. Coe, M. D. |
| Lyon..... | Emporia..... | R. W. McCandless, M. D. |
| Logan..... | Winona..... | H. B. B. Montgomery, M. D. |
| Marion..... | Peabody..... | C. A. Loose, M. D. |
| Marshall..... | Waterville..... | H. Humfreyville, M. D. |
| McPherson..... | McPherson..... | J. E. Ronze, M. D. |
| Miami..... | Oswatimie..... | E. C. Pace, M. D. |
| Montgomery..... | Elk City..... | John T. Davis, M. D. |
| Morris..... | Council Grove..... | Z. T. Haver, M. D. |
| Morton..... | Richfield..... | L. C. Bowers, M. D. |
| Meade..... | Meade Center..... | C. Button, M. D. |

COUNTY HEALTH OFFICERS—CONCLUDED.

| <i>Counties.</i> | <i>Towns.</i> | <i>Health officers.</i> |
|-------------------|-------------------|-----------------------------|
| Nemaha..... | Centralia..... | Alice G. H. Anderson, M. D. |
| Ness..... | Ness City..... | J. N. Venard, M. D. |
| Norton..... | Norton..... | E. M. Turner, M. D. |
| Osage..... | Burlingame..... | James Haller, M. D. |
| Osborne..... | Osborne..... | B. F. Chilcott, M. D. |
| Ottawa..... | Minneapolis..... | J. F. Brewer, M. D. |
| Pawnee..... | Larned..... | J. M. Cummings, M. D. |
| Phillips..... | Phillipsburg..... | Hugh Wallace, M. D. |
| Pottawatomie..... | Westmoreland..... | J. S. Spangler, M. D. |
| Pratt..... | Pratt..... | Thomas McElwain, M. D. |
| Rawlins..... | Ludell..... | J. L. Constable, M. D. |
| Reno..... | Hutchinson..... | A. W. McKinney, M. D. |
| Rice..... | Lyons..... | N. F. Terry, M. D. |
| Rooks..... | Stockton..... | D. J. Donnell, M. D. |
| Rush..... | La Crosse..... | Wm. Goodwin, M. D. |
| Russell..... | Russell..... | Joseph W. Robb, M. D. |
| Saline..... | Salina..... | J. W. Jenney, M. D. |
| Scott..... | Scott City..... | Joseph T. Bond, M. D. |
| Sedgwick..... | Wichita..... | E. B. Rentz, M. D. |
| Shawnee..... | Topeka..... | Frank Bailey, M. D. |
| Sheridan..... | Hoxie..... | J. A. Wintermetz, M. D. |
| Sherman..... | Goodland..... | E. E. Burwell, M. D. |
| Smith..... | Lebanon..... | W. C. Bower, M. D. |
| Stafford..... | St. John..... | C. M. Maxfield, M. D. |
| Stevens..... | Hugoton..... | C. L. Ebnoter, M. D. |
| Sumner..... | Wellington..... | W. O. Barnett, M. D. |
| Stanton..... | Johnson City..... | C. A. Culver, M. D. |
| Thomas..... | Colby..... | W. M. Edwards, M. D. |
| Wallace..... | Wallace..... | J. N. Page, M. D. |
| Wabauunsee..... | Alma..... | E. N. Eldridge, M. D. |
| Wichita..... | Leoti..... | A. R. Knapp, M. D. |
| Wilson..... | Fredonia..... | F. M. Wiley, M. D. |
| Woodson..... | Yates Center..... | S. J. Bacon, M. D. |

CONTENTS.

| | PAGE. |
|---|---------|
| MEMBERS OF THE STATE BOARD OF HEALTH..... | ii |
| LIST OF COUNTY HEALTH OFFICERS..... | iii |
| PREFACE TO THE REPORT..... | vii |
| SECRETARY'S REPORT..... | 1 |
| MEMBERS OF STATE BOARD OF HEALTH AND TERMS OF OFFICE..... | 3 |
| STANDING COMMITTEES..... | 3-4 |
| MINUTES OF THE SESSIONS OF THE BOARD..... | 5-13 |
| SECRETARY'S QUARTERLY REPORTS..... | 14-48 |
| Prevention of Tuberculosis..... | 18-19 |
| Form for reporting cases of "La Grippe"..... | 25-26 |
| Small-pox in Clay Center..... | 26 |
| Chemical analysis and microscopical examination of sample of hydrant water from Leavenworth..... | 27 |
| Sanitary work in the city of Leavenworth..... | 27-28 |
| Letters of commendation as to the value and benefits of the reports of the K. S. B. H..... | 31 |
| Chemical analysis and microscopical examination of a sample of water from Fredonia..... | 32 |
| Chemical analysis and microscopical examination of a sample of water from Hutchinson... | 33 |
| Chemical analysis and microscopical examination of a sample of water from Winfield..... | 34-36 |
| Ancient Irish Grippe..... | 36-37 |
| Cholera in Japan, 1836 to 1837..... | 37 |
| Leprosy in Pennsylvania..... | 40 |
| Benefits from the Scarlet-Fever Pamphlets..... | 41-42 |
| Contagious-disease certificate, form for use..... | 43 |
| Interstate notification of infectious and contagious diseases..... | 44-45 |
| Chemical analysis and microscopical examination of samples of water from Hutchinson.... | 46-47 |
| SPECIAL REPORTS: | |
| Report of a case of glanders in man..... | 50 |
| Report of a case of smallpox in Topeka..... | 49-59 |
| Report of delegates to the National Conference of State Boards of Health..... | 51-55 |
| Report of delegates to the American Public Health Association..... | — |
| Report of special committee appointed to visit the State charitable institutions..... | 56-61 |
| PAPERS: | |
| The Influence of Habit on the Body, by W. L. Schenck, M.D., of Topeka, Member State Board of Health..... | 62-64 |
| Practical Measures for Controlling the Spread of Infectious Disease, by E. S. Middlebrook, M.D., of Kansas City, Mo., clerk of Board of Health..... | 64-66 |
| FINANCIAL AND PROPERTY STATEMENT: | |
| Financial statement..... | 67 |
| Property statement, embracing list of books belonging to the library, and list of supplies belonging to the office of secretary..... | 67-68 |
| ANNUAL REPORTS OF COUNTY HEALTH OFFICERS..... | 74-95 |
| REPORTS OF VITAL STATISTICS FOR THE YEARS 1888, 1889, and 1890..... | 96-97 |
| REPORTS OF BIRTHS FOR THE YEAR 1890..... | 97-108 |
| REPORTS OF DEATHS FOR THE YEAR 1890..... | 108-120 |
| REPORTS OF MARRIAGES FOR THE YEAR 1890..... | 120-126 |
| METEOROLOGICAL..... | 127-142 |
| PROCEEDINGS OF NATIONAL BOARDS: | |
| Sixth annual meeting of the National Conference of State Boards of Health—synopsis of the proceedings of the..... | 143-167 |
| American Public Health Association, eighteenth annual session..... | 258 |

PROCEEDINGS AND ADDRESSES OF THE FIFTH ANNUAL STATE SANITARY CONVENTION:

| | |
|---|-----|
| Address of welcome; by Judge R. B. Spilman, of Manhattan..... | 172 |
| Response; by Pres. Geo. T. Fairchild, of Manhattan..... | 174 |
| The water-supply of Manhattan; by Geo. E. Hopper, Esq., of Manhattan..... | 174 |
| The sanitary budget and household gems; by J. W. Redden, M. D., of Topeka, Secretary State Board of Health..... | 175 |
| Light in the school-room; by Prof. J. D. Walters, of the State Agricultural College, Man- hattan..... | 186 |
| The popular demand for infant-feeding; by J. W. Jenney, M. D., of Salina, member of State Board of Health..... | 190 |
| The proper education of woman; by R. C. Musgrave, M. D., of Grenola, member of State Board of Health..... | 193 |
| Nuisances—What they are and how to abate them; by H. C. Irish, Esq., of Manhattan..... | 197 |
| Bacteria and disease; by Prof. N. S. Mayo, of the State Agricultural College, Manhattan..... | 199 |
| Sanitation—Its object and scope and legislation; by R. A. Williams, M. D., of Olathe, member State Board of Health..... | 203 |
| Intoxicants and health; by Rev. D. C. Milner, D. D., of Manhattan..... | 208 |
| Store-room food; by Prof. Nellie S. Kedzie, of the State Agricultural College, Manhattan... | 213 |
| The hygiene of the school; by Prof. John M. Bloss, superintendent Topeka public schools, | 216 |
| The examination of drinking-water; by Prof. G. H. Failyer, of the State Agricultural College, Manhattan..... | 221 |
| Sanitation in relation to crime; by Hon. R. A. Sankey, of Wichita..... | 224 |
| The prevention of zymotic diseases; by J. Milton Welch, M. D., of Wichita, member of State Board of Health..... | 227 |
| Prevention of pulmonary phthisis; by Prof. E. W. Shaufler, M. D., of the Kansas City (Mo.) Medical College..... | 232 |
| The works and wants of a State board of health; by H. D. Hill, M. D., of Augusta, member State Board of Health..... | 233 |
| The relation of alcoholics to preventive and State medicine; by W. L. Schenck, M. D., of Topeka, member State Board of Health..... | 236 |
| Water purification; by Col. Wm. Tweeddale, C. E., of Topeka..... | 245 |
| Resolutions..... | 250 |
| Petitions and invitation to hold next convention at Salina..... | 251 |
| Adjournment..... | 252 |
| INDEX..... | 257 |

REPORT OF THE BOARD.

PREFACE.

KANSAS STATE BOARD OF HEALTH,

OFFICE OF THE SECRETARY, TOPEKA, KAS., January 1, 1891.

To Hon. Lyman U. Humphrey, Governor:

SIR—In compliance with the eleventh section of the act to create and establish a State and local Boards of Health in the State of Kansas, approved March 7, 1885, I have the honor to submit to you the accompanying report for the year 1890.

Very respectfully,

J. W. REDDEN, M. D., *Secretary.*

WE herewith submit the Fifth Annual Report of the Kansas State Board of Health.

ANNUAL REPORTS.

The annual reports of the State Board of Health are in constant demand. Sanitarians, chemists, engineers, librarians, professional and business men, as well as mechanics and laymen, are anxious to secure them. The first three volumes are virtually exhausted, while but few copies of the last two are on hand. Letters of commendation, as to their value and benefits, are frequently received from leading sanitarians in all sections of our country. The work of the State Board of Health is greatly impaired and embarrassed on account of the limited appropriation made by the Legislature. In its object, scope, and labors, it is one of the most important and far-reaching in its beneficence of the many State boards; and yet, strange as it may appear, it received the smallest appropriation of any of them.

STATE SANITARY COMMITTEES.

We could call the attention of the readers to the reports made by the sanitary committees who visited the State charitable institutions under the direction of the State Board of Health. The information and sugges-

tions contained therein are worthy of careful and thoughtful consideration. While our State charitable institutions are admirable in architectural appearance, yet it is to be deplored that they contain defects as to the proper and complete sanitary systems for ventilation, light and purity of water supplies, resulting from not consulting and employing an expert sanitarian to model and execute the correct and most advanced plans for effectually securing these most essential and fundamental principles for all State as well as private institutions.

LOCAL AND STATE BOARDS OF HEALTH.

In many States the law makes it compulsory upon every city and town to keep a local board of health organized and ready at short notice to act for the protection of the public in case of an emergency. Such a provision should be embodied in every State board of health law. With such a central power and mandatory authority, and placed in close and direct communication with every county and town in the State, it would be capable of so thoroughly educating the people in the principles of preventive medicine and enforcing sanitary measures as to rob disease of much of its terror, banish pestilence, neutralize epidemics, and place the masses on the highway to prosperity, health, and longevity. Armed with such power, each board could have ample opportunity to wield its authority and influence in banishing filth, disease and death from thousands of otherwise desolate firesides, and thus sending prosperity, sunshine and happiness to the hearts and homes of tens of thousands of our fellow-men.

Knowledge is power; and the State and local boards of health are grand powers for the advancement of human knowledge, for the noblest of all purposes—the betterment of the physical, mental and moral conditions of all mankind.

SPECIAL REPORTS.

We would call attention to the special reports of the cases of glanders and small-pox, and ask you to note the management and result of each. These of themselves are potent factors and conditions as to the value and utility of these beneficent organizations.

We would also refer you to the reports of the delegates to the national conference of the State Boards of Health, and the American Public Health Association. While they are worthy of careful perusal, they will also convey to the mind of the reader some idea of the scope of their work, their disinterested philanthropy, and their liberal humanitarianism.

REPORTS OF COUNTY HEALTH OFFICERS.

While all the annual reports of the county health officers are of interest, the following are worthy of special notice, namely, the counties of Labette, Marion, Nemaha, Pratt, Rooks, and Shawnee. Read them carefully, note the important facts contained therein, and then decide if you think any county can dispense with such officials, or ever dream of abolishing such an indispensable organization.

SMALL-POX IN KANSAS.

In 1889 this disease was introduced into this State from Missouri, Colorado, California, Nebraska, Arizona, and New Mexico, until twenty-one counties were invaded by this loathsome disease, resulting in 387 cases, with only fifteen deaths. This result is chiefly attributable to the prompt and efficient measures adopted, and thoroughly enforced by the energy and vigilance of the county and State boards of health. So thorough and general were the preventive measures, such as vaccination and disinfection, so enforced, that during this past year, 1890, the disease only made its appearance in four counties in the State. In each instance the disease originated from importation from other States; it was confined to a single family in each county, except one, and that one was where the commissioners had abolished the county health office under the false and flimsy pretext of *economy*; and in this instance the State Board of Health had to establish quarantine, and enforce efficient preventive and restrictive measures, so as to control and stamp out the disease. Before the matter was reported to the State Board of Health, the disease had gained a foothold, and twenty-three cases resulted, with four deaths, due mainly to the fact that there was no county health officer. It will cost the county one hundred fold more than it would to have paid for the services of a county health officer for ten years, to say nothing of the distress, suffering, and loss of life, the terror of the community, and the depression of business.

TUBERCULOSIS IN SLEEPING-CARS.

It would be difficult to conceive of a conjunction of circumstances more directly aiding in the dissemination of this disease than is offered in the palace car. It is always badly ventilated; the vestibule car especially is close and hot, sixteen to thirty persons being crowded into a space which might make a small hall in a house, but never a bedroom for a pair of human beings. Somebody is always hurt by a draught, and windows are kept closed to prevent ventilation as well as ejection of sputa, which is

mostly deposited on the floors, and the temperature is raised to a degree sufficient to rapidly disseminate infectious matter. Consider now that every car curtain is or has been recently occupied by a consumptive patient, if only *en route* for a change of climate, and that through ignorance, carelessness, or weakness, there comes to be deposited upon bedding, curtains, etc., tuberculous matter. What becomes of it, if it be not dried and disseminated through the car, or gradually into the lungs of the tired traveler? While this is true, it is a source of great satisfaction to know that the great scientist and bacteriologist of the present age has discovered an antidote for this great *enemy* of the human race. Koch's lymph, or tubercolin, may be classed as the great discovery of the present age, the *par excellence* boon for the human race. Let us cherish the belief, that it will prevent or stamp out consumption as effectually as Jenner's vaccine virus has small-pox. For the consummation of this end let us earnestly labor, and then patiently wait.

PURITY OF WATER AND ICE.

The State Board of Health has given much time and thought to the subject of the purity of the ice and water-supply; urging upon the people the importance and necessity of having pure water and even ice for drinking, culinary and refrigerator purposes; urging these facts upon the masses by circulars, analyses, and microscopical examinations of suspected water and ice for the benefit and guidance of the people. We should remember that a certain amount of pollution—however vigilant the authorities may be—will always exist in water drawn from running streams, or ponds, unless it is thoroughly filtered through some indestructible granular substance, such as magnetic spongy carbon, that will oxidize or destroy the dissolved organic matter. This is a very vital subject for the people of Kansas, who are compelled to use hydrant-water from the streams or driven wells, where there is no approved filtering process. Again, no ice is fit for use for any purpose, that is frozen from water that is unfit for drinking or culinary purposes. We must bear in mind that disease germs may be in ice, and lay dormant for months in their ice home, and yet when taken into the system will retain vitality sufficient to communicate disease and death.

ADULTERATION OF FOOD.

The adulteration of food and milk is much more general than is known, or even suspected. Our State laws are very defective and lame on this subject; while the State Board of Health is virtually powerless to push vigorously this very important and vital field of research.

More food and milk is adulterated than we have any idea of. The cows from which we obtain milk should be free from any disease. These subjects demand careful consideration and frequent investigation; and anyone found guilty of the adulteration of food or milk should be severely punished. This subject is of the first importance, and the people should not rest content until we have on our statute books adequate laws, and some State board invested with ample power for their enforcement, so that the people shall be protected from any danger whatever from the possibility of using adulterated food, impure ice, or contaminated water.

DISAPPEARANCE OF SMALL-POX IN GERMANY.

We have referred to the beneficial results, in Kansas, from enforcing vaccination. As an additional argument, of great force and importance, that the State Boards of Health should be armed with ample power to make vaccination, and re-vaccination, compulsory, we would ask you to read and digest the following conclusive facts. Under the beneficent law of Germany, making vaccination compulsory and providing for re-vaccination at stated periods of life, small-pox is almost completely disappearing from the German Empire. A late official report states that in 1888 only 110 deaths from small-pox occurred in the whole Empire, and that this number is fifty-eight fewer than occurred in 1887; and in 1887, fewer than occurred in 1886. Of the 110 deaths, 88, or about four-fifths of the whole number, occurred in those parts of the Empire immediately bordering other countries not well protected by vaccination, and in which there is constant intercourse between the vaccinated and unvaccinated sides of the boundary. More than one-third of all the deaths occurred in the Prussian province of Posen. Comparing the small-pox death-rate of the large cities of other countries with that of the large cities of Germany: it was 136 times as great in the cities of Austria, 30 times as great in those of Hungary, 16 times as great in those of England, 24 times as great in those of Belgium, and twice as great in those of Switzerland, as in German cities. We Americans do not long for the paternal arm of a monarchical government to be thrown around us, but there are still lessons for us to learn of the value and sacredness of human life, and of the duties of free republics in guarding it.

LA GRIPPE.

This disease has been quite prevalent in Kansas during the past four months, though of a much milder type, of less duration, and much less fatal than it was a year ago; but in many of the larger cities, particularly Chi-

cago and New York, it has been not only prevalent, but quite fatal, causing considerable alarm in consequence. The annual reports published in this volume contain much information on this subject, and are deserving of careful consideration. It is still a controverted question, whether it is a contagious disease, or produced by peculiar atmospheric conditions. Much, however, can be done to prevent its spread, or modify its type so as to render it not fatal. My friend Dr. Kennedy, Secretary and Executive Officer of the Iowa State Board of Health, has very ably and wisely reached the following conclusions:

"FIRST. Aged persons; those who are infirm because of years or of chronic diseases, especially lung diseases; those who are specially susceptible to "colds," and those who have never had the disease, or, having had it, have not regained their health, should not wantonly expose themselves to those affected. There is a possibility, if not probability, that the disease is infectious, and that it may reproduce itself by exposure to it. So long as there is a doubt about its contagiousness, persons, so far as possible, should keep away from it. 'Prevention is better than cure,' because it removes the necessity for cure.

"SECOND. *In case of an attack the patients should remain indoors and take good care of themselves, applying the remedies indicated until all symptoms of the disease have disappeared*, which is usually three or four days. Nearly all deaths have occurred, and nearly all the cases that became chronic, did so because of relapses from exposure. Such a course would not only secure in ninety-nine out of one hundred cases prompt recovery, and prove a safeguard against relapse, but in case of the disease being contagious, would prevent the needless exposure of others to it.

"While the disease is usually mild and of short duration, and compared with the number taken, but few have died, yet no disease, not excepting cholera or yellow fever, save perhaps consumption, have ever within so short a time invaded so many homes all over our land, and been so cosmopolitan in its ravages as La Grippe.

"Such an intelligent dread of the disease as will lead to the isolation and proper care of those attacked; and to the prevention of the needless, if not criminal exposure of the well, is what is needed, and will be productive of the most good."

DANGER OF CHOLERA.

There are indications that during the present year cholera will cross the Atlantic or Pacific and seek a foothold in this country. This is not a thoughtless declaration, or a statement in the interest of boards of health, but is based upon the fact of the virulence and prevalence of the disease in the East the past year, and its progressive course westward; and from what we know of former epidemics, our trans-oceanic communications with foreign countries, and our great through railroad systems, there is a strong probability that America will be visited by this disease.

We are not warranted in regarding the existence and progress of this and similar epidemics as visitations of Providence, but as the result of filth and exposure to disease germs.

There is also great danger that this disease may be imported by vessels engaged in transporting Mohammedan pilgrims. As is well known, every Mohammedan must at least once in his lifetime make a pilgrimage to Mecca. The rich Mohammedans go yearly. There are four months of the year during which the journeys are made. Beginning at the west, the Mohammedans come from the west coast of Africa as far south as Senegal, arriving by caravan, and taking vessels at Tangiers, Oran, Algiers, Phillipeville, all on the Algerian coast, or they may go by caravan as far as Alexandria. From the far east they come from the straits settlements, (Malacca, Penang, Singapore, Java, Sumatra,) Calcutta, Ceylon, Bombay, and coast of India. Those who die *en route* to Mecca are assured of eternal salvation, and this accounts for their utter indifference to sickness and death. During the year 1890, the number of pilgrims who arrived at Jeddo, by sea, were 43,000, of which number only 28,000 returned; 15,000 were, therefore, left on the plains, or along the route of travel. The average number of deaths per day was 600, and it is well known that a large proportion of the mortality was caused by cholera.

Now the vessels that convey these pilgrims are the vessels of all the civilized and enlightened nations, and it is authoritatively stated that it is simply disgraceful, the manner in which they are allowed to be overcrowded without affording sufficient protection. The condition of the pilgrims is filthy and pitiable. They invariably carry their own provisions—the ships furnishing none—and many suffer from want of proper food. They are packed together “as close as sardines,” not only between decks, but on the upper decks, where they have scarcely room to move. The most serious feature of this transportation, however, is the fact that the lantrines for their use are built out over the vessel’s sides forward, and the ship’s sides become filthy in the extreme, and cannot be or at least are not cleaned *en route*. As cholera generally appears among the pilgrims, the danger is obvious. The ship’s crew complain of the risk to themselves. For days after the pilgrims have disembarked, and even after fumigation and repeated washing-out the bilge, a strong stench clings to the vessel. Now this same vessel may immediately go to a healthy port and secure cargo with a clean bill of health, and sail for any port in the United States. Ordinarily, a vessel’s bow and sides will receive a thorough washing, but at times a steamer will encounter smooth seas throughout the voyage; nor is it beyond reason to suggest that in isolated portions, in seams, on hawesers, tackle, etc., choleraic dejecta may remain.

While this is true, we should bear in mind that there are certain well-known conditions that favor the introduction and spread of this disease, which are fortunately unnecessary and avoidable; and should this disease be imported, its progress may be checked and stamped out by observing and enforcing well-established rules and measures for the prevention of said conditions. If the National and State boards of health are empowered with ample authority and adequate funds, acting in concert at the ports of entry and along the great trans-continental railroad systems, with proper vigilance in enforcing repressive and restrictive measures, they will be able to check its advance and stamp it out, and probably prevent even its introduction into our country. For the accomplishment of this purpose the following well-established rules should be well understood and faithfully observed:

1. INTERSTATE NOTIFICATION.—Immediately upon the appearance of the first well-recognized case in this country, every State and Provincial board of health should be notified of its location and the source of infection, and of the measures adopted to prevent its spread.

2. PERSONAL AND DOMESTIC CLEANLINESS.—Every family, and every person in every family, or public or private institution, should use the utmost endeavor not only to prevent the befoulment of the earth, air and water, but should render the most efficient aid in the destruction of all filth and garbage. The old adage that "every man should sweep before his own door," should be the motto adopted by all. Every house-furnace or kitchen fire should be a crematory, where all waste vegetable and animal matter should be burned. Everything capable of polluting the soil, the air, or the water, should be cremated, or sterilized by boiling, super-heating, or disinfection.

3. The person should be kept scrupulously clean, and the greatest physical vitality maintained by proper exercise and suitable food and drink.

4. The clothing should be such as to secure the greatest freedom to the circulation and the least tendency to chill.

5. It should be remembered that quarantine stations and the seaports are not the only places where the disease may originate, and that a high temperature is not necessary for its existence. Its very first appearance in this country might be in Kansas, Mexico, or California. The importation of rags, clothing or bedding befouled with the discharges from a choleraic patient, if not properly disinfected, might produce the disease in Alaska, so far as climate is concerned.

6. When cholera has made its appearance, the mildest forms of diarrhea should be looked upon with suspicion, receive appropriate treatment, and the discharges be disinfected and buried, or, what is better, cremated; they should never be thrown into a running stream, nor placed where they could gain access to any water-supply.

7. Panics should be avoided. Fear debilitates and demoralizes, and interferes with proper preventive measures. It has been truly said: "Cleanliness and courage are the strongest weapons against cholera; filth and fear the very worst."

STATE SANITARY CONVENTIONS.

It is with pleasure that we direct the attention of the reader to the proceedings of the Fifth Annual State Sanitary Convention, published as a supplement in this volume.

The papers are of a high order, and contain valuable information for the benefit of the public. These conventions have been great factors of education, and cannot be too highly commended. The leading educators, sanitarians, professional men, chemists and physicians are among the active members and ardent advocates. Their influence in moulding thought, educating the heart, and inciting the people to noble actions is incalculable. Their chief aim is on the line of *preventive medicine*, believing and enforcing the well-established motto: "An ounce of prevention is better than a pound of cure." We labor also for the purpose of disseminating and enforcing the practical measures for controlling the spread of infectious and contagious diseases, and we would emphasize the following condensed facts so forcibly and aptly presented by Dr. Middlebrook, secretary of the Kansas City Board of Health:

"Two centuries ago the mortality of London was eighty per one thousand; now it is twenty-three. A century ago ships could hardly sail the seas because of scurvy; now scurvy is almost unknown. Not many years since, jails and hospitals were hotbeds of dangerous and infectious diseases; now these are absolutely free from danger. Why this change? Because the sanitarian, by study of pathology and ætiology, has been able to arrest the spread of infectious diseases by means readily used. Hence, the necessity for recognition of the *first case* of a contagious disease is apparent, and the danger of non-report to the authorities is appreciable to all. But, strange to say, even in this enlightened age, there are some physicians who do not appear to realize the importance of reporting infectious diseases to the health department, and often the first intimation we have of the existence of a dread malady is the appearance of the undertaker with a death certificate reading 'diphtheria,' 'scarlet fever,' or 'small-pox,' written as the cause of death. Is this right? Is this professional? Is it 'co'-operating with the Board of Health 'to stamp out disease and carry out the noblest object of the physician—prophylaxis?' As a department of the city government, the health department is almost powerless if

compelled to work alone; in the suppression of disease not only should neighbors act with neighbors, towns with towns and States with States, but physicians should assist the health office. Besides, doctors ought, as far as possible, to aid in enlightening the people in sanitary matters. If this could be universally done, it would accomplish more than any Edward Bellamy in abolishing epidemics, paupers' bills, hospitals, asylums, and jails."

THE NATIONAL AND STATE GOVERNMENTS, AND PUBLIC HEALTH.

The Government is taking a deep interest in State agricultural colleges. A bill was introduced into Congress providing for the establishment of an agricultural college in every State where they do not already exist, and making a liberal annual appropriation for their maintenance. While this is commendable, and would prove profitable, still the health of the people is a subject of far greater importance and interest. Should the Government pass a law making an annual appropriation from \$5,000 to \$10,000 to each State Board of Health, it would insure active operation and progressive developments of State Boards of Health in every State in the Union. This, supplemented by the State appropriations, would insure their hearty coöperation with each other; and, auxiliary to the National Board of Health as the central power, would revolutionize sanitary progress and discoveries in a marvelous manner, would prosecute investigations respecting the cause of disease, and the best methods of removing or neutralizing those causes, as would result in untold benefit, repay a thousand fold the money appropriated, and afford the best possible safeguard for the people.

CONCLUSION.

The establishment of boards of health is a duty of the State that cannot be disregarded. Their full, complete, and ample equipment is incumbent on the State administrations, and should be liberally discharged as their first and most important duty. Yet this, when provided in the most complete and perfect way, does not relieve the individual of his personal obligations to society, and his duty to the well-being of the community in which he resides. Every one should feel his obligation as a sanitary agent in promoting the cause of health and preventing the advance of disease. Health boards must have the support and loyalty of the citizens, if the highest purposes are to be realized. It will not do to leave everything to them and disregard all obligations as individuals. Everything that goes to make up a perfect community is borne equally by the individual, and there is no exception to this in the matter of health. Therefore, it is the chief duty, and should be the impelling motive of every individual to strive to

do all in his power to promote the common-sense and practical methods for the prevention of disease and the promotion of public health. Should the National, State, county, and municipal authorities, the communities, families, and individuals labor with zeal and constance vigilance for the welfare of each other, the eradication of disease and the promotion of health, it would only be a short time until the mortality would be lessened one hundred fold, life prolonged as in ancient times, and every fireside would be crowned with the jewels of prosperity, healthfulness, contentment, and happiness.

G. H. T. JOHNSON, M. D.,

President.

J. W. REDDEN, M. D.,

Secretary, and Executive Officer.

PART II.

SECRETARY'S REPORT.

I HAVE the honor as well as the pleasure of presenting the following as the Sixth Annual Report of the State Board of Health. In the arrangement and composition a similar plan has been adopted as in the preceding reports, presenting only those subjects which are of more permanent value and interest, and omitting the minor details of work and correspondence which are of only passing interest.

There has been no change in the membership of the State Board of Health since the last annual report was issued.

The names and addresses of the members of the Board, with the dates at which their terms of office expire, are as follows:

| | | |
|--------------------------------------|------------------|------------------------------|
| G. H. T. Johnson, M. D., President.. | Atchison | Term expires March 28, 1893. |
| D. C. Jones, M. D..... | Topeka.... | Term expires March 28, 1893. |
| J. Milton Welch, M. D..... | Wichita..... | Term expires March 28, 1893. |
| Robert C. Musgrave, M. D | Grenola..... | Term expires March 28, 1892. |
| R. A. Williams, M. D..... | Olathe..... | Term expires March 28, 1892. |
| W. L. Schenck, M. D..... | Osage City *.... | Term expires March 28, 1892. |
| H. D. Hill, M. D..... | Augusta | Term expires March 28, 1891. |
| Frank Swallow, M. D..... | Valley Falls.... | Term expires March 28, 1891. |
| J. W. Jenney, M. D..... | Salina..... | Term expires March 28, 1891. |
| J. W. Redden, M. D..... | Topeka..... | Secretary. |

The President appointed the following committees for the year:

STANDING COMMITTEES.

1. Water Sources, Sewerage, Drainage, and Disposal of Substances Injurious to Health—J. Milton Welch, M. D.
2. Legislation, Revision of Rules and Regulations, and Library—H. D. Hill, M. D.
3. Topography, Meteorology, and Hygiene of Public Institutions—D. C. Jones, M. D.
4. Special Sources of Danger to Life and Health—Frank Swallow, M. D.
5. Adulteration of Food, Drinks and Drugs—R. C. Musgrave, M. D.
6. Epidemic and Endemic Diseases, and Quarantine—R. A. Williams, M. D.
7. Hygiene of Occupations, and Railway Sanitation—W. L. Schenck, M. D.

* Removed to Topeka since appointment.

8. Heating, Ventilation, Lighting, and Hygiene of Schools—J. W. Jenney, M. D.

9. Vital Statistics, Registration, Meteorological Service, and Nomenclature—J. W. Redden, M. D.

10. Executive—G. H. T. Johnson, M. D., D. C. Jones, M. D., and H. D. Hill, M. D.

11. Finance—D. C. Jones, M. D., Frank Swallow, M. D., and J. Milton Welch, M. D.

ABSTRACTS AND BRIEF ACCOUNTS

OF THE PROCEEDINGS AT MEETINGS OF THE STATE BOARD OF HEALTH DURING THE
YEAR ENDING DECEMBER 31, 1890.

FIRST QUARTERLY MEETING.

TOPEKA, KANSAS, March 13, 1890.

The regular quarterly session of the Kansas State Board of Health was held at the office of the Secretary, on Thursday, March 13, 1890.

Present: Drs. Johnson, Hill, Welch, Jones, Williams, Schenck, and Musgrave.

The Secretary read letters he had received from Drs. Swallow and Jenney, stating that it was impossible to attend the present session of the Board.

The Board was called to order at 4 P. M.; the President, Dr. Johnson, in the chair.

On motion, the reading of the minutes of the last meeting was dispensed with.

The Secretary then read his quarterly report, giving a synopsis of the work performed throughout the State during the present quarter by the various county health boards with a view of enforcing all necessary sanitary regulations for the prevention or restriction of all contagious and pestilential diseases. The past three months have been very remarkable for their general good health throughout the State and comparative freedom from epidemic diseases, except the influenza, which, as a rule, has been mild in its type, and has now subsided. While in very many of the other States small-pox is reported as prevailing, no case has been reported, up to this date, within the border of Kansas, showing the beneficial results of the efficient sanitary quarantine measures thoroughly enforced during the past year.

On motion, said report was approved and ordered engrossed for publication.

The Secretary then read communication from Dr. Probst, of Ohio, Secretary of the National Conference of State Boards of Health, informing the Board, that the next annual (sixth) session of said Association would convene in Louisville, Ky., in May, and that he would notify the Secretary the time as soon as it was definitely settled; and requesting the State Board to appoint delegates to attend said National Conference.

On motion, the President was instructed to appoint two delegates and two alternates to attend said conference. The President then appointed Drs. Welch and Schenck as delegates, and Drs. Hill and Jones as alternates.

The Secretary then read a communication from the Secretary of the Health Board of the City of Mexico. Said communication was written in Spanish, and the following is a literal translation of it:

"The Fourth Annual Report of the State Board of Health of the State of Kansas, which you were pleased to remit with your polite note of the 9th of January last, has been received in this office. I have the honor to advise you thereof.

"Liberty and the Constitution.

"MEXICO, February 7, 1890.

T. J. B. AVELLANO, *Secretary.*"

Dr. Williams introduced the subject of the purity of the well-waters of the State of Kansas for drinking purposes, and its effect upon the people who use it freely, as to the production of stomach and kidney troubles. This subject was freely discussed by all the members present. Dr. Williams was requested to prepare a paper upon this subject, giving the subject as thorough consideration as his time will allow him, and to submit it to the consideration of the Board at as early a date as possible.

The following resolution was unanimously adopted:

Resolved, That the regular quarterly meetings of the State Board of Health shall hereafter be held at the office of the Secretary on the first Tuesday in March, June, September, and December, unless otherwise ordered by the Executive Committee.

The following bills were referred to the Auditing Committee:

Expenses of members attending sessions of the Board:

| | |
|--|---------|
| Dr. Welch..... | \$17 25 |
| Dr. Johnson..... | 9 32 |
| Dr. Schenck..... | 5 00 |
| Dr. Musgrave..... | 18 80 |
| Dr. Hill..... | 16 00 |
| Dr. Williams..... | 10 25 |
| J. A. McLaughlin, for three months' rent of office-rooms..... | 60 00 |
| Kellam Book and Stationery Co.: | |
| To ten-quire record for office..... | 13 00 |
| To two reams of wrapping-paper..... | 3 00 |
| To two dozen blank tablets..... | 2 00 |
| Hall & O'Donald, for two wood-cuts for Fifth Annual Report..... | 10 00 |
| J. W. Redden, to traveling and other necessary expenses to New York and return, attending the International Congress of Hygiene, as Delegate from the State Board of Health..... | 100 00 |

The Auditing Committee, after examining the above bills, made a favorable report upon them and ordered them paid.

On motion, the Board approved of said report.

After transacting considerable business of a miscellaneous nature, on motion, the Board adjourned to meet in regular annual session on the first Thursday in June, at the office of the Secretary, at 4 P. M.

J. W. REDDEN, M. D., *Secretary.*

SECOND QUARTERLY (SIXTH ANNUAL) MEETING.

TOPEKA, KANSAS, June 5, 1890.

The State Board of Health convened in regular quarterly session (sixth annual meeting), at the office of the Secretary, on Thursday, June 5th, at 4 P.M.

Upon roll-call the following members were present: Drs. Johnson, Jones, Welch, Hill, Swallow, Schenck, and Jenney. The President, Dr. Johnson, in the chair.

The minutes of the last quarterly meeting were read and approved.

The Secretary then read his quarterly report, reviewing the work done, and the results of same, since the last meeting. On motion, the report was received, approved, and engrossed for publication in the Sixth Annual Report.

The Secretary then read a special report by Dr. W. A. Williamson, County Health Officer of Shawnee county, giving a history of a case of small-pox in the suburbs of Topeka in April. The patient recovered, and the quarantine was so effectual that no other case resulted from it.

On motion, the report was received, and ordered filed for publication in the next annual report.

The Secretary read a communication from the General Baggage Master of the A. T. & S. F. R. R., requesting the State Board of Health to use the uniform series of blanks for the transportation of corpses, as prepared and recommended by the National Association of General Baggage Masters. On motion, said communication was received, and referred to the Secretary and the committee on blanks and printed supplies.

Dr. Welch presented to the Board a statement in reference to a stream running through a portion of Wichita, and its unhealthy condition in consequence of slaughter-house offal, and other decomposing animal matter being allowed to be discharged into it.

After the subject was thoroughly discussed by the members of the Board, it was decided that the Wichita City Health Board and municipal authorities could control or suppress the nuisance, as they had already condemned it as such.

On motion of Dr. Welch, Dr. Johnson was unanimously elected President of the State Board for the next year. There was no change made in the office of the Secretary, Dr. Redden having been continuously in office as Secretary and Dr. Johnson as President of the Board since the organization, April 5, 1885.

The following bills were read, and referred to the Auditing Committee :

Expenses of members attending the session of the Board, as follows :

| | |
|------------------|---------|
| Dr. Hill..... | \$16 00 |
| Dr. Welch..... | 15 34 |
| Dr. Johnson..... | 9 02 |
| Dr. Swallow..... | 6 00 |
| Dr. Schenck..... | 5 00 |
| Dr. Jenney..... | 12 50 |

| | |
|--|---------|
| Estate of J. A. McLaughlin, on office rent account..... | \$30 00 |
| E. J. Broberg, services as janitor for six months..... | 30 00 |
| Dr. Alexander, for chemical analysis and microscopical examination of a sample of water from Leavenworth..... | 15 00 |
| Excelsior Gas Co., for gas for office for six months..... | 3 80 |
| Dr. Hill, traveling and other necessary expenses, as a delegate to the National Conference of State Boards of Health, at Nashville, Tenn..... | 70 00 |
| Dr. Schenck, traveling and other necessary expenses, as a delegate to the National Conference of State Boards of Health, at Nashville, Tenn..... | 59 00 |
| Wells, Fargo & Co., express charges on reports and blanks for past six months, 103 | 01 |
| Pacific Express Co., express charges on reports and blanks for past six months..... | 94 16 |

On motion, the Board took a recess until 8 P.M.

At 8 P.M. the Board reconvened. The same members were present as in the afternoon.

The Auditing Committee reported all bills referred to them approved and ordered paid. On motion, said report was approved.

Drs. Hill and Schenck, delegates to the National Conference of State Boards of Health, made very interesting reports of the transactions of said Conference. On motion, said reports were received, and ordered engrossed for publication in the next annual report.

On motion, Dr. Jones was appointed a delegate to the International Congress of Medicine, at Berlin, Germany, in August.

On motion, the following were appointed a committee to arrange for the next Annual Sanitary Convention, to be held at Manhattan, next December: Drs. Schenck, Welch, Jones, and Redden.

On motion, the Board adjourned to meet in regular quarterly session on the first Thursday of September, at 4 P.M., in Topeka, at the office of the Secretary, unless the time and place of meeting should be changed by the order of the Executive Committee.

J. W. REDDEN, *Secretary*.

THIRD QUARTERLY MEETING.

TOPEKA, KANSAS, September 4, 1890.

The Board met in regular quarterly session, at the office of the Secretary, at 4 P.M.

Upon roll-call the following members were present: G. H. T. Johnson, M. D., President, Atchison; D. C. Jones, M. D., Topeka; J. Milton Welch, M. D., Wichita; H. D. Hill, M. D., Augusta; Frank Swallow, M. D., Valley Falls; R. C. Musgrave, M. D., Grenola; R. A. Williams, M. D., Olathe; J. W. Jenney, M. D., Salina; and J. W. Redden, M. D., Secretary, Topeka.

The minutes of the last quarterly session were read, approved, and ordered engrossed for publication.

The Secretary then read his quarterly report; giving a review of the work that had been accomplished by the health officers throughout the

State. The general sanitary condition throughout the State was never in a better condition, nor the outlook for good health more encouraging. The report also showed that various cities throughout the State were apprehensive lest their public water-supplies were becoming impure and unwholesome, and were having samples of the water thoroughly analyzed to determine whether or not they were safe to use for drinking or culinary purposes.

The report also showed the great value of vaccination as a safeguard against the invasion or spread of small-pox in any form or in any locality; likewise it gave a synopsis of the prevalence and fatality of cholera, and the threatened danger of the invasion of this terrible scourge on the Pacific coast through our direct maritime intercourse with Japan.

On motion, the report was received, approved, and ordered engrossed for publication.

On motion, the President appointed Drs. Jones and Swallow as delegates, and Drs. Williams and Hill as alternates, to attend the eighteenth annual session of the American Public Health Association, to be held at Charleston, S. C., in December.

The President appointed special committees to visit the State institutions—the Insane Asylum and Reform School, at Topeka; the Deaf and Dumb Asylum, in Olathe; and the Institution for the Blind, at Kansas City, Kas.—and make a careful and thorough examination of the sanitary condition of the buildings and their surroundings, the system for ventilation and heating, and the source and quality of the water-supplies. They were instructed to prepare a special report, giving the result of their examinations, and submit said reports to the meeting of the Board in December.

The committees appointed were: Drs. Hill and Jenney, to visit the institution at Olathe; Drs. Williams, Welch, and Jones, to visit the institution at Kansas City, Kas.; and Drs. Swallow, Jones, and Musgrave, to visit the institutions at Topeka.

The Secretary then read a report made by Dr. Pratt, of Hiawatha, and County Health Officer of Brown county, giving an interesting history of a case of glanders in a man in Brown county. Said report was received, and ordered engrossed for publication.

Dr. Williams called attention to the danger of the waters of the Kaw river being contaminated from the sewerage systems emptying their contents into the stream.

The following article was then read, bearing directly upon this subject:

“AN OBJECTION FROM KANSAS.

“The Legal Rights in O. K. Creek Sewer to be Determined.

“The two cities of the Kaw’s mouth have a ‘bone of contention.’ Just what this ‘bone’ will amount to, is at present locked up in the breast of City Counselor L. W. Keplinger. At the meeting of the City Council in Kansas City, Kas., last evening, a resolution was introduced by Councilman Scheller providing that the City Counselor be instructed to ascertain the legal right of Kansas City, Mo., to run a sewerage system into O. K. creek, which flows into Turkey creek, and finally empties into the

Kaw. The resolution was introduced by the Kansas City, Kas., Councilman, from a sanitary standpoint, as he explained it. He said that Kansas City, Mo., was preparing to poison the Kaw with the filth of two-thirds of this city, when it should send its sewage into the 'mighty Missouri that runs down to the sea.' Foreseeing many knotty points ahead, the wary Councilmen, one and all, voted quickly to refer it to the Counselor.

"What can Kansas City, Kansas, do?" queried Councilman Scheller, when approached by a *Journal* reporter. 'Well, there is a board of health in the State of Kansas, that has a sort of jurisdiction over all matters of that kind, and if the members of the same see proper they may declare the thing a nuisance and shut off supply from the Missouri city. It is better for both cities to start the subject now, as Kansas City, Missouri, is spending vast sums of money in its efforts to direct the sewage through to the Kaw. We don't want any of it, for the Kaw runs slowly at the mouth, and filth would accumulate there that would drive us out of the city.'

"In view of the fact that the City Council has not decided where the outlet of the O. K. creek sewer will be, the Council of Kansas City, Kansas, is a little premature," said a city official last night. 'The second mile of the sewer will end near Twenty-first street and Grand avenue. To what point the sewer will be extended from there, no one knows at present. That is a matter to be hereafter determined. The sewer may follow O. K. creek to Turkey creek, and it may not. Owing to the fact that Turkey creek and the Kaw river are sluggish streams, it is possible that the sewer will empty into the Missouri river below its junction with the Kaw. As I understand, that is the intention of City Engineer Butts. So far as O. K. creek is concerned, it has been an open sewer for years, and the officials of Kansas City, Kansas, are getting their 'kick' in rather late.'

The question of the purity of all running streams in Kansas, and their being protected and kept free from impure and poisonous sewage and deposits, is one that sooner or later must engage the attention of our leading sanitarians and chemists, and about which the people in general should feel no little uneasiness, for it is an admitted fact that such conditions may produce and propagate dangerous and fatal epidemics.

All the bills created by the Board since the last meeting, and the expense accounts of the members attending this meeting of the Board, were read, and referred to the Auditing Committee. Said committee approved of the bills, and on motion, they were ordered paid.

The following are the bills referred to the Auditing Committee, and ordered paid:

| | |
|--|---------|
| J. A. Penney, executor, rent, etc., to September 30. | \$90 00 |
| Wells-Fargo Express, charges on reports and blanks. | 41 00 |
| J. L. King, P. M., postage, stamps, postals, and paper wrappers. | 90 00 |
| Dr. Reid Alexander, for analysis of two samples of water, from Wilson and Reno counties. | 20 00 |
| Expenses of members attending this session of the Board — | |
| Dr. Swallow. | 6 00 |
| Dr. Welch. | 17 75 |
| Dr. Musgrave. | 18 40 |
| Dr. Hill. | 16 00 |
| Dr. Jenney. | 13 10 |
| Dr. Johnson. | 6 12 |
| Dr. Williams. | 11 80 |

The following subjects were selected by the different members of the Board to prepare a paper or address upon said subjects, to be presented at the next (fifth) annual State Sanitary Convention, to be held in Manhattan on Thursday and Friday, December, 4th and 5th:

Cost of Unnecessary Sickness, G. H. T. Johnson, M. D., Atchison.

Personal Hygiene as to Fluids Drank, Foods Eaten and Clothing Worn, D. C. Jones, M. D., Topeka.

The Hygienic Prevention of Zymotic Diseases, J. Milton Welch, M. D., Wichita.

The Work and Wants of the State Board of Health, H. D. Hill, M. D., Augusta.

Hygiene of the Teeth, Frank Swallow, M. D., Valley Falls.

Sanitation: Its Object and Scope, R. A. Williams, M. D., Olathe.

Hygiene of Farm Houses and Buildings, W. L. Schenek, M. D., Osage City.

The Proper Education of Woman, R. C. Musgrave, M. D., Grenola.

Personal Hygiene as to Habits Formed, J. W. Jenney, M. D., Salina.

Sanitary Budget, or Facts Wise and Otherwise, J. W. Redden, M. D., Topeka.

Healthful Homes, H. S. Roberts, M. D., Manhattan.

School Hygiene, Prof. J. M. Bloss, superintendent of city schools, Topeka.

After social and free discussion and conference, as to the labors of the State and county health boards, the appreciation of the work by the people in general, the importance and benefits of the observance of sanitary measures, the purity of all water-supplies, and the importance of healthful homes, on motion the Board adjourned to meet in quarterly session in Manhattan, on Thursday, December 4, at 4 p. m., to be followed by the sixth annual State Sanitary Convention.

Respectfully submitted.

J. W. REDDEN, M. D., *Secretary*.

FOURTH QUARTERLY MEETING.

MANHATTAN, KANSAS, December 5, 1890.

The State Board of Health convened in regular quarterly session at 5 o'clock p. m., in the parlors of the Higginbotham House, Manhattan, Kansas.

Dr. Johnson, the President, being absent, on motion Dr. Jenney was elected President *pro tem*.

Present: Drs. Jones, Welch, Hill, Williams, Schenek, and Jenney. Dr. Swallow was present, but was called home before the Board met. Dr. Johnson telegraphed that he was detained on account of sickness, and Dr. Musgrave was detained on business.

The minutes of the last meeting were approved.

The Secretary read his quarterly report, giving a résumé of the labors performed by the State and county health boards during the past quarter;

and noting the events of interest, the progress made, and the health of the State; and the comparative freedom from epidemic and contagious diseases. On motion, said report was approved, and ordered engrossed for publication.

The committee, appointed at the last meeting of the Board, to visit, carefully examine the sanitary condition and surroundings, as well as the system for heating, drainage, ventilation and water-supply, of the State Asylum for the Deaf and Dumb, the Blind Asylum, the Insane Asylum, and the Reform School, made their reports. On motion, said reports were received, and ordered engrossed for publication.

Dr. W. A. Williamson, County Health Officer, made a special report of the four cases of small-pox which occurred in the eastern suburbs of Topeka. These, and the case reported in April last by Dr. Williamson, are the only cases of small-pox, in any form, which have come to the knowledge of the State Board, throughout the State, during the entire year; and the contagion in these two families was unquestionably imported from another State. A very creditable as well as remarkable showing of the preventive and restrictive measures so faithfully enforced by the Health Boards.

On motion, said report was received, and ordered engrossed for publication.

This report, as well as the reports of the sanitary inspecting committees, will be found printed on subsequent pages of this volume.

The following bills were read, and referred to the Auditing Committee:

| | |
|--|--------|
| Wells, Fargo & Co., for express charges for supplies the present quarter.... | \$3 86 |
| Pacific Express Co., do. do. do. | 2 83 |
| Dr. Welch, for special sanitary services in visiting and examining the State Blind Asylum..... | 52 74 |
| Dr. Jones, for special sanitary services in visiting and examining the State Blind Asylum..... | 27 00 |
| Dr. Williams, for special sanitary services in visiting and examining the State Blind Asylum..... | 13 50 |
| Dr. Swallow, for special sanitary services in visiting and examining the State Insane Asylum and Reform School..... | 16 00 |
| Dr. Musgrave, for special sanitary services in visiting and examining the State Insane Asylum and Reform School..... | 48 30 |
| Dr. Hill, for special sanitary services in visiting and examining the State Deaf and Dumb Asylum..... | 50 08 |
| J. L. King, P. M., for postage stamps the present quarter..... | 60 00 |
| J. A. Penney, executor, for three months' office rent, to December 31..... | 60 00 |
| E. J. Broberg, services as janitor for six months, up to December 31..... | 30 00 |
| Expenses of members, attending this session of the Board: | |
| Dr. Welch..... | 16 18 |
| Dr. Hill..... | 19 13 |
| Dr. Swallow..... | 13 00 |
| Dr. Jones..... | 5 00 |
| Dr. Schenck..... | 7 50 |
| Dr. Williams..... | 13 40 |
| Dr. Jenney..... | 8 00 |
| Dr. Redden..... | 12 75 |

On motion, the Board took a recess until 6:30 p. m.

At 6:30 P. M. the Board reconvened. Same members present as at the previous session.

The Auditing Committee made a favorable report on all the bills referred to them. On motion, the report was approved, and the bills ordered paid.

Communications, and petition from the Board of Trade, professors of colleges, physicians, ministers, business men, and prominent citizens of Salina, inviting the State Board to hold next December session, in connection with the sixth annual State Sanitary Convention, at Salina, were presented, and being favorably considered, were referred to the evening session of the State Sanitary Convention for definite action.

The Secretary tendered his resignation as Secretary of the State Board, to take effect at the close of the present fiscal year, June 30, 1891, for the following reasons: First, the duties and clerical work of the office confine him too closely within the office; second, he wishes to give his entire attention to his profession, and thus have more outdoor exercise.

On motion, the Board adjourned to meet at the office of the Secretary, in Topeka, on Tuesday, January 20th, 1891, at 4 P. M.

J. W. REDDEN, M. D., *Secretary*.

ABSTRACTS OF QUARTERLY REPORTS,

PRESENTED BY THE SECRETARY AT REGULAR MEETINGS OF THE STATE BOARD OF HEALTH.

FIRST QUARTERLY REPORT.

MR. PRESIDENT, AND GENTLEMEN: Since the last session of the Board, the Fifth Annual Report has been finished, and is now in the hands of the State Printer, and will be distributed as soon as completed. It will contain more information than the last annual, and we believe in every respect it will be more interesting and instructive.

The demand for the reports of the Board is steadily increasing, and in a short time the former editions will be exhausted. The pamphlets and circulars so generously distributed and so freely published and circulated by the press in every part of the State, are accomplishing good results in educating the people to appreciate the efforts of the State and county health boards in furnishing them with necessary and valuable information pertaining to the restriction and prevention of contagious, infectious and pestilential diseases.

The State sanitary conventions have been growing in interest and importance, while that held last December in many respects surpassed all preceding ones.

The past year has been one remarkable for general good health and comparative freedom from epidemics. Small-pox was imported from other States, and secured a foothold in several counties; yet by prompt and efficient quarantine, isolation, and the well-known preventive measures enforced by the county health boards, under the direction of the State Board, it was promptly controlled and effectually stamped out. Scarlet fever, diphtheria and typhoid fever are becoming better understood, more systematically managed and controlled to the great benefit of families as well as communities.

It is true that influenza, or la grippe, has swept over the State in an epidemic form; while it has been generally of a mild type, and has passed away as suddenly as it appeared, yet it has been by far more fatal than is generally believed or even known. Not only have many deaths resulted directly from it, but it has been the exciting and moving cause whereby great fatality has followed in its wake from other diseases lurking in the system, which seemed only to require this additional spark to produce sad consequences. While the young and old seemed more susceptible to its influence and power, yet no age, sex, race, or condition in life secured perfect immunity from its approach and effect. It is to be hoped, however, that

all sanitarians, health officers, and the people generally, may learn a profitable lesson from recent experiences, and exercise the most thorough sanitary measures as sure and effectual safeguards against the threatened approach of a more pestilential and fatal epidemic.

During the present quarter, one additional county has organized a new Health Board, and appointed a County Health Officer, as follows: Dr. C. A. Culver, of Gognac, County Health Officer of Stanton county. He has received full supplies, with necessary instructions, and has entered upon his work as sanitary supervisor of his county.

The following changes have been made in county health officers: Dr. Thomas McElwain, of Pratt, has been appointed County Health Officer of Pratt county in place of Dr. J. M. Rogers; Dr. H. B. B. Montgomery, of Russell Springs, has been appointed County Health Officer of Logan county in place of Dr. W. H. Keeney; Dr. S. S. Kaysbier, of Seneca, has been appointed County Health Officer of Nemaha county in place of Dr. A. J. Best; Dr. E. J. Donnell, of Stockton, has been appointed County Health Officer of Rooks county in place of Dr. L. B. Powell; Dr. C. Button, of Meade Center, has been appointed County Health Officer of Meade county in place of Dr. C. W. Adams; Dr. A. W. McKinney, of Hutchinson, has been appointed County Health Officer of Reno county in place of Dr. S. H. Sidlinger; and Dr. J. F. Brewer, of Minneapolis, has been appointed County Health Officer of Ottawa county in place of Dr. John Miller.

We have at the present time more county health boards than ever before since the organization of the State Board; while the other counties, through the county clerks and the press, render material aid and assistance in publishing and distributing the literature of the Board for the benefit of the people.

The following is a brief abstract of the monthly reports from county health officers:

2 deaths and 7 births from Kearny county.

3 deaths and 5 births from Logan county.

9 deaths and 6 births from Labette county.

8 deaths and 16 births from Phillips county.

3 deaths and 5 births from Johnson county.

31 deaths and 13 births from Reno county.

Under the interstate notification of dangerous, communicable diseases, I have received the following communications: From Dr. Baker, Secretary of the Michigan State Board of Health, under date of December 2d, "one case of small-pox at Muskegon; the person sick is Magnus Olsen, a male about twenty-six years old. Arrived November 14th direct from Denver, Colorado, where he undoubtedly contracted the disease; he was taken sick November 20th." As stated by the local health officer, "the house has been quarantined, and every precautionary measure taken to confine it to its present limits." Under date of December 5th, he reports two cases of

small-pox at Colony, Cass county. The persons sick are Nora Darling, a female aged eight years, taken sick November 11th, and Clancy Smith, aged four years. The origin of the disease is unknown. The danger of the disease spreading is great, because many persons were exposed before the disease was known to be small-pox; and in some instances the orders of the health officer in regard to isolation were disobeyed. Under date of February 12th, he reports a case of small-pox at Grand Rapids, in the person of a laborer loading and unloading lumber cars in the south part of the city. The person was a resident, and the origin was unknown. The patient and persons most exposed were removed to contagious-disease hospital. Twenty-six others, suspected of having been exposed, were promptly isolated, vaccinated, and put under surveillance. The danger of the disease spreading was not great, although many were exposed, because the health authorities of the city are on the alert, and have all necessary means of dealing with the outbreak. Under date of February 26th, he reports one case of varioloid at Big Rapids. The person sick is Mrs. Addie Murray, a widow, who came from Lake View about February 12th, and taken sick February 20th. She is a resident. The origin of the disease is unknown. The patient has been removed to the outskirts of the city and there quarantined. The health officer thinks the danger of spreading the disease is not great.

Dr. Hewitt, Secretary of the Minnesota State Board of Health, under date of December 23, reports a case of small-pox at Minneapolis, and also a case at Sleepy Eye. The case in Minneapolis came from Missouri about December 10, and the case at Sleepy Eye came from Wisconsin the latter part of November. Isolation and vaccination have been enforced.

Dr. Lindsey, Secretary of the Connecticut State Board of Health, reports, under date of January 18, two cases of small pox, one at Windsor Lake, and one at East Windsor, in the persons of William Dolan and Calvin Bessenger; the former contracted the disease while riding in a hack which had conveyed a small-pox patient to the hospital. January 25th, he says, two cases of small-pox at Windsor Lake, one case at East Windsor, and one case at Waterbury. The persons are all adults. The origin of the disease was the rag-room of the Seymour paper mill, and the succeeding cases by contagion. And under date of February 14, he wrote, seven cases of small-pox at Meriden. The persons are working-people and foreigners. The origin of the disease is unknown.

Dr. Rauch, Secretary of the Illinois State Board of Health, writes February 15, two cases of small-pox at Anna. Source of contagion thought to be from tramps; also one case of small-pox in the person of a negro at East St. Louis. Every precaution has been taken by the local authorities to prevent its spread.

I have given these extracts to show that even in these old States, with their perfect systems of regulations and vigilance, this disease is introduced from other States, gains a foothold, and gives occasion for labor, expense

and anxiety; also as evidence of the prompt and efficient observance of the interstate notification agreement, and the benefits resulting therefrom.

It is a source of pleasure to state that up to the present time, not a single case of small-pox has been reported as having occurred in any county in the State during the present year. This result should certainly be gratifying to the people; and an unanswerable argument of the value and efficiency of the State and county health boards in destroying the germs of this dreaded plague, and protecting the people from its evil consequences.

Prof. Snow, of the State University, has willingly and very kindly furnished me monthly and annual weather reports and meteorological observations for 1889, which are interesting and valuable, and will be published in the Fifth Annual Report; he is also furnishing reports regularly for the present year.

It is a source of satisfaction that many of the leading colleges and universities in our country are introducing at least a partial course in hygiene and bacteriology, and the time is approaching when they will be compelled to give them and kindred subjects more attention and thoroughness. It is a pleasure to refer to the following announcement. It is a pioneer movement which will soon be followed by many other colleges and institutions of learning, and with beneficent results and influence:

THE JOHNS HOPKINS HOSPITAL.—ANNOUNCEMENT.—INSTRUCTION IN HYGIENE.

A course of instruction in Practical Hygiene, under the charge of Dr. John S. Billings, Surgeon U. S. Army, and Lecturer on Hygiene in the Johns Hopkins University, assisted by Dr. A. C. Abbott, Assistant in Bacteriology and Hygiene in the Johns Hopkins Hospital, will be given in this institution during the months of March, April and May, 1890.

The course will begin Monday, March 3d, and will continue for four days in each week, (Monday, Tuesday, Thursday and Friday,) from 9 until 12 o'clock A. M., until Friday, May 30th. One hour each day will be given to demonstrating the methods to be employed in the day's work; the remaining two hours will be for the practice of the methods by the students.

The instruction will be given by lectures and practical work in the laboratory.

I. *Lectures.* A course of four lectures will be given by Dr. Billings during April to advanced students in hygiene, the subject selected being "Sewage Disposal." These lectures will be given on Mondays at 4:30 P. M., beginning Monday, April 7. 1890.

II. *Practical Work in the Laboratory* will comprise—

- (1.) Investigation of the atmosphere—physical, chemical, bacteriological.
- (2.) Investigation of the water—chemical, bacteriological.
- (3.) Investigation of the ground—physical, chemical, bacteriological.
- (4.) Inspection of milk and meat.
- (5.) Studies upon ventilation and heating.
- (6.) Practical work in disinfection and sterilization, both chemical and thermal.
- (7.) Inspection of ground for building sites.
- (8.) Inspection of building materials.
- (9.) Inspection of clothing materials.

The planning and construction of public buildings and school houses does

not receive that careful consideration as to sanitary condition and surroundings that the health and comforts of the inmates absolutely require; nor do the State boards of charities, or inspecting committees, give this subject the care, investigation and oversight, which its importance demands, and the interests of the people require. The following condensed statistics and facts bearing upon this subject are startling, true, and convincing; and well worthy of consideration and record. The State Board of Health of Indiana has finished its inquiry into the sanitary conditions of the school houses of that State, with the following startling results:

"In 3,186 schools there are 1,833 near-sighted pupils, 18 per cent. of the grounds need drainage, 71 per cent. of the houses are not properly ventilated, 12 per cent. not properly heated, 34 per cent. have blackboards between the windows, 35 per cent. of the blackboards have bad surfaces, 30 per cent. have bad water-supply, 10 per cent. have no closets, 41 per cent. of the closets in bad condition, 11 per cent. of the closets not separated for the sexes, 45 per cent. have dangerous nuisances near them, 6 per cent. require pupils to be vaccinated, 52 per cent. of pupils coming from families in which contagious diseases are prevailing are not excluded from school, and 22 per cent. of the houses are not suitable for the district. The dangerous nuisances referred to are cemeteries and ponds."

This State is not alone in its unsanitary conditions of school-houses. In other States dangerous and disgraceful conditions exist. Where shall the blame be placed? Who shall be held responsible for this state of affairs? There is a serious wrong somewhere. In such cases the State Board should be empowered to discover the responsible parties, who should be punishable by the laws of the State. Here are buildings erected by some one who endangers the health and lives of thousands of children, and escapes punishment for his crime. These houses are let by contractors who have no care beyond the money they can make. In this age they cannot be considered ignorant of the sanitary laws that should govern the erection of school buildings. This thing has been going on long enough, and authorities should be held responsible for a further continuance of the evil. There is nothing to prevent the proper authorities from having a building thoroughly inspected by a competent person, and, if found deficient in any particular, they can refuse to accept it from the contractor. There is too much carelessness in this matter on the part of all concerned, and the sooner some are severely dealt with the better.

The very important subject of the prevention of tuberculosis is one that is occupying the thorough investigation of sanitarians and scientists; and while the results of said investigation are startling to many, yet there are gratifying evidences of the achievements in hygiene and sanitary science, for the education of the people, and the benefit of humanity. Bearing directly upon this interesting question, the following resolutions were adopted by the Academy of Medicine, in Paris, February 6, 1890:

1. Tuberculosis is a parasitic and contagious disease, caused by a microbe found in expectorations, and carried in the form of dust.

2. It is advisable to destroy these expectorations by means of boiling water and fire.

3. The parasite is also sometimes found in the milk of tuberculous cows, for which reason it is not prudent to use milk unboiled, especially when it is intended for the food of young persons.

4. The Academy directs the attention of the authorities to the danger which tuberculous persons create for the communities in which they live, such as colleges, barracks, large commercial establishments, and Government workshops.

The prevalence of typhoid fever in many sections of our State, and the fatality resulting from this disease are arousing no little interest among the people. And while the sanitarians and medical profession in general recognize it to a great extent to be a preventable disease, yet how little attention, comparatively speaking, is paid to the well-known rules and regulations, or to its prevention and restriction; and how little concert of action there is shown by families and communities in enforcing and executing the important preventive measures that are distributed and published freely, for the prevention of this disease, and as safeguards for the people. And in this connection, we would emphasize the following important fact: Typhoid bacilli may live for at least four or five months when thrown upon the ground. This emphasizes the importance of speedily conducting all manner of refuse from dwellings and business apartments to some place where these germs will become innocuous.

The question of cholera spreading westward during the present year, is causing not only apprehension but also uneasiness among all classes of people in Europe as well as America. We cannot therefore be too vigilant or active in urging upon every community, family, and individual to exercise and practice all possible means to carry out and enforce all sanitary measures to place every household and locality in the very best possible sanitary condition; and remove and destroy everything that would even have a tendency to assist, or encourage any germ or contagion to find lodgment, only too soon to show its evil effect upon the business, and its fatal results upon the lives of thousands of homes and firesides. The Governor of the Colony of Queensland, Australia, has recently issued a proclamation declaring quarantine against the island of Sumatra, on account of cholera, as follows:

"Whereas, it has been reported to me, the Governor aforesaid, that the island of Sumatra is infected with cholera, an infectious disease, dangerous to public health; now, therefore, I, Sir Henry Wylie Norman, the Governor aforesaid, in pursuance and exercise of the power in me vested by the said act, and by and with the advice of the Executive Council, do, by this my proclamation, notify that the island of Sumatra is infected with the said disease, and that it is probable that such disease may be brought from the said island to the colony of Queensland; and, with the advice aforesaid, I do further notify, order, and direct that every ship which arrives at any port or place in Queensland from, or after having touched at, the island of

Sumatra, and which shall have had actual communication with any part of the shore of said island, or which brings passengers or goods from the said island, and all vessels and boats which receive any passengers or goods from any such ship, shall, upon arrival at any port or place in Queensland, be placed in quarantine, and shall perform quarantine for the period of fourteen days from date of arrival.

"Given under my hand and seal, at Toowoomba, this sixteenth day of December, in the year of our Lord one thousand eight hundred and eighty-nine, and in the fifty-third year of Her Majesty's reign.

"By command, for the Chief Secretary:

JOHN M. MACCROSSAN.

"God save the Queen!"

Again, we would call attention to a dispatch of more recent date, from Russia, showing that danger is apprehended in that direction also, from supposed cholera in Persia; and we cannot at this time give too strong an emphasis to this subject. The following is the dispatch:

"ST. PETERSBURG, RUSSIA, January 27.—Reports from Astrabad show that in the province of Khorassan a disease of the bowels is raging, which has caused frightful mortality. Three thousand deaths have already been reported. At Nur, in Meshed, three hundred persons are dying on the average daily. The character of the plague is not exactly known, on account of the want of efficient physicians. Cholera having raged last fall in western Persia, and thousands of persons having fled from there to the east of the empire in order to escape the disease, it is supposed that the plague in Khorassan is cholera, and that the same has been brought in by the refugees."

Does it not therefore behoove every national, State, county and municipal health board to guard effectually every avenue of approach in their respective jurisdictions, against any possible contingency whereby this dangerous and fatal plague may find lodgment in any of the borders thereof?

I have received notice that the next (sixth) National Conference of State Boards of Health will be held in the city of Louisville, Ky., about May 1; have not yet been informed of the exact date. I was requested to formulate a question, and send to the Secretary of the Conference, Dr. C. O. Probst, to be submitted to its sessions for consideration and decision; and also to suggest some member to lead in the discussion of said topic. In accordance with the above request, I sent the following to Dr. Probst:

"Is it not both important and very desirable for all the State Boards of Health to have a uniform system of blanks for the reports of Vital Statistics; and, if decided in the affirmative, have a committee appointed to prepare said blanks? Discussion to be opened by Dr. Kennedy, of Iowa, or Dr. Abbott, of Massachusetts."

In concluding this report, I wish to emphasize with equal force another equally important fact, and would urge it upon the attention of every sanitarian, health officer, physician, and individual in our State; and that is, the vital importance of regular and systematic notification to the proper health officers of every case of infectious or contagious disease. To enforce this truth, I will cite the following fact: Dr. Monroe, in the *London Lancet*, says—"In the town of Jarrow, England, the system of compulsory notification of infectious diseases has been the means of saving, during the past ten years, an average of *eighty lives, and one thousand cases of sickness per year.*"

Equally true and striking illustrations might be given of similar results in towns in our own State, from the observance and enforcement of the rules and regulations issued and distributed under the auspices of this Board. No estimate in dollars and cents can be made of the lives saved, and of sickness prevented by such measures. It is along this line of sanitary progress that the greatest results can be seen by the people, and the benefits thereby secured, to some extent, are appreciated; and yet we have but entered upon the threshold of what might be accomplished were adequate means and power conferred upon this Board. The paltry amounts appropriated for the use of the Board to carry out the provisions of the *law* creating it, weak as *it* is, passes into utter insignificance, even upon financial basis, in comparison to what has been saved to the State, communities and families in this one line of sanitary and preventive measures.

This Board is one of the most important branches of the State Government. While its importance and benefits are not fully appreciated, and while it meets with opposition from many quarters, yet it is gradually but surely winning its way to the confidence of the people, and at no distant day will command the approbation of officials and individuals; and adequate means and power will be conferred upon it, to carry out effectually, all measures it may undertake, and all regulations and orders it may issue for the collection and tabulation of correct and thorough vital statistics, the prevention of disease, and the protection of the people.

To accomplish this, it may be necessary both to labor and to wait. In the meantime, let us not forget to practice this precept, emanating from a great sanitarian, and verified by many generations:

"Be not weary in well-doing, for in due season ye shall reap, if ye faint not."

Respectfully submitted.

J. W. REDDEN, M.D., *Secretary*.

TOPEKA, March 10, 1890.

SECRETARY'S SECOND QUARTERLY (SIXTH ANNUAL) REPORT.

MR. PRESIDENT, AND GENTLEMEN: While we assemble to-day in the sixth annual session, it is a source of satisfaction and pleasure to state that at no period in the history of the Kansas State Board of Health has there been less sickness throughout the entire State. To what extent this may be attributable to the influence of the sweeping epidemic of la grippe, that passed so rapidly, and prevailed so generally throughout our entire State; or to the instruction and educational powers of the State sanitary conventions; or to the sanitary measures inculcated, disseminated and enforced by the State and county health boards, may be a question difficult of solution. Yet that it is largely attributable to the labors and results of the measures adopted and recommended by the State Board of Health, there can be no question. At no time since I have been a resident of the State, for the

past eleven years, has there been less general sickness, and that of a milder type, and fewer epidemics or endemics of any character, than for the past five months; never has there been a time when the physicians have had as fine an opportunity for rest, recreation and study.

Since the organization of this State Board of Health, April 5, 1885, four of the nine original members are still on the Board, viz.: Drs. Welch, Johnson, Schenck, and Jenney; while Dr. Jones was appointed in place of Dr. Stormont, deceased; and Drs. Hill, Swallow, Musgrave, and Williams occupy the positions respectively of Drs. Guibor, Surber, Roberts, and Wright, whose terms had expired by termination; and Dr. Lewis was the successor of Dr. Wright, and the predecessor of Dr. Williams.

At this time last year small-pox was existing, or had been prevailing during the year in 21 counties in the State, resulting in 387 cases and 15 deaths; while during the present year but one case in the entire State has been reported; that one was in the suburbs of Topeka; it was promptly detected, and at once quarantined, isolated, and rigid precautionary measures strictly enforced. The patient was a woman of middle age; she recovered, and has been discharged, having entirely recovered without communicating the disease to any other person, even to any of her own family, consisting of herself, her husband, and three children. A special report of this case has been prepared by Dr. Williamson, the County Health Officer of Shawnee county, and also a member of the City Board of Health of Topeka; said report will be presented to the Board at this session. This remarkable result is due mainly to the efficient and thorough measures enforced last year to stamp out and eradicate the germs of the disease throughout the State, and the educational measures so generally distributed and so ably indorsed by the press throughout the State.

Since the last meeting of the Board, 2,500 copies of the Fifth Annual Report of the State Board of Health, 1,000 bound in muslin and 1,500 bound in paper, have been printed, and the larger portion of them have been distributed among the health officers, State and county officers, and sanitarians of this and other States. The reports of this Board show progress and improvement in all departments of labor. We take great pleasure in referring to a few of the many received in confirmation of this statement.

Dr. Rauch, Secretary of the Illinois State Board of Health, and the leading sanitarian of this country, under date of May 16th, writes:

"DEAR DOCTOR: Thanks for the copies of your Fifth Annual Report. It shows decided progress."

Prof. Williston, of Yale College, under date of May 3d, writes:

"MY DEAR SIR: My friend Dr. C. A. Lindsley, Secretary of the Connecticut State Board of Health, very kindly offered me one of the copies of your Fifth Annual Report, which he has received from you. I have read it with great interest, but am unwilling to deprive Dr. Lindsley of the copy. I have been much interested in sanitary matters in this State for the past five years, as perhaps you have observed from the Connecticut Reports, and I am interested in your work. I beg the favor of such of the past reports of your Board, as you may be able to furnish me."

Dr. Milroy, Secretary of the Omaha Medical College, writes June 3d:

"DEAR DOCTOR: The interesting and valuable reports, which you sent at my request, came to hand. I desire to express my thanks for same."

Dr. Williamson, Director of the State Historical Society, and formerly Health Officer of Washington county, under date of May 15th, writes:

"DEAR SIR: Your valuable Fifth Annual Report is received. It deserves to be highly appreciated by the public, for the labors of the State Board of Health have accomplished a work of vital importance to all the people throughout the State."

Dr. E. S. Bailey, professor in the Hahneman Medical College, of Chicago, writes me, on June 5th, as follows:

"Received the Fifth Annual Report of the Kansas State Board of Health, and can but regard the book as certainly a big step in the right way of conserving public health."

And George Homan, M.D., Secretary of the Missouri State Board of Health, and professor of Hygiene and State Medicine in the Missouri Medical College, under date of May 15th, writes:

"Permit me to thank you for copies of your report for last year, which are just at hand. I congratulate you on style and substance of work."

Since the last meeting of the Board, the following changes among the County Health Officers have taken place: April 8th, J. W. Robb, M.D., of Russell, was appointed County Health Officer in place of J. W. Long, M.D.; April 9th, J. Ion Ardery, M.D., of Hill City, was appointed County Health Officer of Graham county, in place of B. P. Williamson, M.D.; J. A. Wintermitz, M.D., of Hoxie, was appointed County Health Officer of Sheridan county, in place of D. M. Freeman, M.D.; G. D. Bennett, M.D., of Newton, was appointed County Health Officer of Harvey county, in place of T. M. Coleman, M.D.; and last, but by no means least, on April 15th, Alice G. H. Anderson, M.D., of Seneca, was appointed County Health Officer of Nemaha county, in place of S. S. Kaysbier, M.D. The latter is the first instance of a female physician being appointed county health officer; but I am pleased to note the fact that she takes hold of the work with commendable zeal and enterprise, as the following extract from one of her letters will indicate:

"I think from the condition of affairs pertaining to this office, the work that has been done for a time past has been in proportion to the pay, which is small. But I would like, if possible, to bring up the records in good shape for this year, though appointed late to the office. However, I shall have to have the coöperation of the physicians, if it be a success. Shall try to stir them up to the benefit of earnest work in this very interesting part of professional work, as soon as I can get matters running smoothly. Any suggestions will be gladly received."

One drawback and impediment in the way of greater and more general sanitary progress by the State Board, is the frequent changes of county health officers by the county commissioners, but this seems unavoidable, as long as the discretionary power to select the above officers and fix their

compensation is vested exclusively in the county commissioners. While the selections, in the main, are commendable and proper, yet the compensation is entirely inadequate to warrant the time, labor and expense necessarily required of the health officers, to properly and efficiently discharge the important duties and execute the trusts committed to them. While this is true, yet it is a notable fact that to-day we have throughout the State more county health officers who are better qualified, and are rendering better service, than ever before. The following condensed statements of the quarterly reports of county health officers are worthy of record: From Crawford county there were reported 102 marriages, 108 births and 88 deaths; 42 of the deaths were under 5 years of age, and 4 were still-births; from measles there was 1 death, from cerebro-spinal meningitis, 1 death; from diphtheria, 2 deaths; from erysipelas, 2 deaths; from paralysis, 1 death; from diarrheal diseases, 1 death; from typhoid fever, 4 deaths; from phthisis pulmonalis, 7 deaths; from acute lung diseases, 14 deaths; from dropsy, 3 deaths; from blood-poisoning, 2 deaths; from la grippe, 8 deaths; and the causes of the other deaths were not reported. From Kearny county there were reported 4 births, 4 deaths, and 1 marriage. The county health officer reports that during the quarter scarlatina has prevailed in the county, and that was about all the disease they had; while for the month of May he reports not a case of death, birth, marriage, or disease of any kind in the county, has come to his notice.

From Lane county, the following is reported: That whooping-cough and influenza have prevailed in all portions of the county; 11 deaths and 9 births were reported; 7 of these were from diphtheria, 1 from phthisis pulmonalis, 1 from typhoid fever, 1 from heart failure, and 1 from poison from the tincture of opium. He writes that the sanitary condition of the public buildings is excellent; that of the Dighton school-house, however, was not so some time ago. The "Ruttan system" is in use in it, and the closets were not cleaned often enough; and the janitor did not understand the *modus operandi* of the ventilating apparatus. "I think it is kept in as good order now as is possible to be with that apparatus, which in my opinion, is not the best by any means. It is made by E. Conlit, of Kansas City, Mo. I do not think the draft in the summer-time, when there are no fires, is sufficient for the complete drying of the contents of the closets. It may be better with the present janitor; but last summer the air was terrible in the basement at times."

From Linn county, the following was received: The burial-case permits show 25 deaths in January, 32 deaths in February, 26 deaths in March, and 9 deaths in April; two are from whooping-cough; 8 are from diphtheria; 1 from typhoid fever; and 14 are from la grippe, and about as many from pneumonia.

From Logan county, I received the following statement: 30 cases of whooping-cough, 16 of measles, 10 of typhoid fever, 5 of diphtheria, 3 of

scarlet fever, and 1 of cholera infantum had been reported; also 15 births. Seven deaths, as follows: 3 from typhoid fever, 2 from acute lung disease, 1 from scarlet fever, and 1 from puerperal fever; the county has no poor-house; we have just completed a new jail; it is built on the latest improved plan, and is in excellent condition.

Phillips county reports: 24 marriages, 21 births; also 26 deaths, from the following diseases: From measles 2, from whooping-cough 2, from diarrheal diseases 1, from phthisis pulmonalis 2, from acute lung disease 3, from la grippe 5, from heart disease 3, from cancer 3, from dropsy 1, and from murder 2. La grippe has prevailed in all parts of the county as an epidemic. In conclusion, the general sanitary condition of our public buildings is good, and they are well kept. The poor-farm is extra large for the number of inmates usually there. The sanitary condition of the county is good, also; the worst of our sanitary condition is the dug-out—where they are dug out in the bank, and the rear is unnecessarily damp and ill ventilated. People who have lived in these abodes for a decade or more of years seem prone to rheumatic and neuralgic conditions not found in those who live on top of the ground. They have a dug-out cachexia, a foul tongue, and a terrible breath, and are not very susceptible to the action of therapeutic remedies.

Reno county reports: 36 marriages, 22 births, and 41 deaths; 18 of the latter are under five years, and 13 are still-births. Undertakers come to time, but the medical fraternity do not.

Rooks county reports that diphtheria has prevailed in portions of the county, but not of a fatal type; and concludes by saying: "The sanitary condition of our public buildings is good. Stockton, the county seat, is well supplied with water by a system of water works, which supplies all our public buildings. The city authorities heartily coöperate with the Board of Health, in the enforcement of sanitary measures. One difficulty to be contended with by the Health Officer, is this: the law makes no provision for any fee for making returns, with penalty for failure to make a full compliance with the law. While some physicians heartily coöperate, others do not, hence our returns are necessarily incomplete. I believe a small fee would be an incentive to prompt returns, and give a fullness to our statistics, which we fail to realize under our volunteer system."

Stevens county reports: That the sanitary condition of the county is good, excepting an epidemic of la grippe, which was not serious; but very few persons escaped, however.

The following circular letter shows interest and progress in sanitary matters, by the author:

WATERVILLE, MARSHALL CO., KANSAS, February 23, 1890.

DEAR DOCTOR: In order to secure reliable data concerning the recent epidemic of "la grippe," will you please mail me your answers to the following questions as soon as possible:

1. How many cases of la grippe did you treat?
2. How many recoveries? How many deaths?

3. To what disease or complication do you ascribe the greatest mortality?
 4. What was the most *prominent* complication?
 5. In your opinion did hygienic influences tend to mitigate or aggravate the course of the disease?
 6. At what age was it most fatal?
 7. Do you believe that la grippe is a disease peculiar to our climate, only manifest in a different form?
 8. Please give the average duration of the disease observed by you?
 9. Were relapses frequent?
 10. Did you use preventive?
 11. Was it a success?
- Remarks.

A prompt answer will be appreciated by

Fraternally yours,

H. HUMFREYVILLE, M. D., *Co. Health Officer.*

From Dr. —; residence, —.

Dr. Lindsley, Secretary of the Connecticut State Board of Health, writes me April 1st, as follows:

"It becomes my duty to inform you that nineteen cases of small-pox have occurred at Meriden, Connecticut, since the last notification. The origin of the disease is from previous cases."

Dr. Lee, Secretary of the Pennsylvania State Board of Health, reports at same date:

"It becomes my duty to inform you that a case of leprosy exists in Philadelphia, in the person of an immigrant. The origin of the disease is unknown. The following precautions have been taken: Isolation in municipal hospital, disinfection of the residence, and examination of all Chinamen in the neighborhood."

Early this month I received notification from Dr. Young, Secretary of the Maine State Board of Health, that one case of small-pox existed at Searsport, in that State, and the usual precautionary measures had been adopted; that the origin of the disease was unknown.

The following letter, from the County Health Officer of Clay county, will be read with interest:

CLAY CENTER, KANSAS, June 9, 1890.

J. W. Redden, M. D., Topeka, Kas.—DEAR DOCTOR: A family by the name of Schiltz arrived in Clay Center from Switzerland, June 1st, 1890. Monday evening, June 2d, the 16-year-old daughter was taken sick, and it developed by Saturday morning to be a case of small-pox. The necessary quarantine measures have been taken. Yesterday, June 8th, the City Board of Health met and ordered the City Marshal to remove the party to a house in the northeast part of the town, two blocks removed from any families. The friends objected. The City Marshal was told by the Mayor to do nothing until this morning. There is trouble in getting a nurse who can talk with the party, as the father and mother refuse to wait on her if removed from their present residence. The house they occupy is about 100 feet east of the nearest house, and perhaps 30 feet from the nearest one directly east of it. I have of course had nothing to do in the case, as there is a city board. Have you any suggestion to offer? With respect,

S. E. REYNOLDS,

Health Officer of Clay County, Kansas.

I replied to Dr. Reynolds, and urged him, as County Health Officer, to see that all proper precautionary measures be promptly and rigidly enforced; and requested him to secure a complete history of the case, and as soon as the quarantine was raised and the patient was discharged, to prepare and send me a full report of the case, with any facts or incidents of interest.

Early in May I received a letter from Dr. Bidwell, Secretary of the City Board of Health of Leavenworth, stating that the city authorities questioned the purity of their hydrant-water for drinking purposes, and stated that the health board were of the opinion that it was the cause of typhoid fever, then very prevalent, and, desired that the State Board of Health should have a sample of said water analyzed for them. I answered Dr. Bidwell's letter, and informed him that the State Board of Health would have one sample of the water examined for them, and sent him printed directions for the preparation of the sample of water; the directions were carried out, and the sample sent to the Chemist of the State Board. Dr. Alexander made a complete analysis of the sample, a copy of which was sent to Dr. Bidwell. The following is the report of the analysis of said sample:

TOPEKA, KANSAS, May 19, 1890.

Dr. J. W. Redden, Secretary Kansas State Board of Health—DEAR DOCTOR: Inclosed please find analysis of water, marked "Sample of water drawn from hydrant at Leavenworth by W. D. Bidwell, M. D., Secretary City Board of Health; source, Missouri river."

| | Grains per U. S. gallon. |
|--|-----------------------------|
| Organic matter..... | .300 |
| Silica, oxide of iron and alumina..... | .500 |
| Bicarbonate of calcium..... | 6.960 |
| Bicarbonate of magnesium..... | 1.392 |
| Bicarbonate of sodium and potassium..... | 4.833 |
| Sulphate of sodium..... | 5.626 |
| Chloride of sodium..... | 1.383 |
| Total solids..... | 20.994 |
| Chlorine..... | .835 |
| | Parts per million. |
| Free ammonia..... | .280 |
| Albuminoid ammonia..... | .170 |
| Microscopic examination: Infusoria. | |

This water is condemned as unsafe for drinking purposes by the best standards owing to the pollution from drainage as indicated by the amount of free and albuminoid ammonia found present.

Very truly yours,

REID ALEXANDER, M. D.,

Chemist and Microscopist of Kansas State Board of Health.

The following is the letter in acknowledgment of the report:

OFFICE SECRETARY LEAVENWORTH CITY BOARD OF HEALTH, May 24, 1890.

J. W. Redden, M. D., Secretary State Board of Health—DEAR DOCTOR: Your letter of the 19th inst., inclosing report of the chemist of the Board on sample of Missouri river water, was duly received, and I thank you for your kindness in the matter. We expect to make use of the report in a few days in order to keep some impurities from entering the river above us, if possible. I think a large proportion

of the organic matter comes from the sewers at Ft. Leavenworth, and that if their sewage were destroyed, in garbage and sewage crematories, our city would be the gainer.

Very respectfully yours, W. D. BIDWELL, *Sec'y.*

The two following letters, also from Dr. Bidwell, are of interest:

LEAVENWORTH, KAS., April 29, 1890.

J. W. Redden, M.D., Secretary State Board of Health—DEAR SIR: Our local board is in great luck at present, having a very efficient sanitary inspector, J. H. Devlin, detailed from the Metropolitan police force. By keeping him in rapid locomotion, many nuisances have been abated a month in advance of the usual spring onslaught on dirty alleys, and filthy privies, and we expect to accomplish much more this coming month. No exact computation of our death-rate can be made, but the statistics of the cemeteries show about 400 interments for 1889, while our population is given at figures varying from 21,800 to 35,000, and nothing but the coming census will give satisfaction on this point.

Very respectfully yours,

W. D. BIDWELL,

Secretary City Board of Health.

The second letter is as follows:

LEAVENWORTH, KAS., May 17, 1890.

J. W. Redden, M.D., Secretary State Board of Health—DEAR DOCTOR: I hereby acknowledge receipt of Fifth Annual Report, for which many thanks. Sanitary work is progressing here, and between April 9 and 30, 422 nuisances were inspected and reported to the parties responsible for same. The same active work is being carried on at present, most of the successes scored being due to moral suasion, as a trial in court exhibits our weakness in the matter of legal provisions.

Very respectfully yours,

W. D. BIDWELL, M.D.,

Secretary City Board of Health.

Chancellor Snow, of the State University, sends regularly to this office full and very interesting monthly weather reports, from observations taken by himself, to whom we are under many obligations for these and other favors so freely rendered. Respectfully submitted.

TOPEKA, June 4, 1890.

J. W. REDDEN, M.D., *Secretary.*

THIRD QUARTERLY REPORT.

TOPEKA, KANSAS, September 4, 1890.

Mr. President, and Members of the State Board of Health—GENTLEMEN: Since our last session in June (the sixth annual), the sanitary condition throughout the State, as well as the general health of the people, has been remarkably good. The reports from all parts of the State fully confirm the fact, that the past summer has been not only unusually healthy, but comparatively free from epidemics and endemics; and even these were mild, and accompanied with but small fatality. In fact, it has been the healthiest summer I have seen since I resided in the State, now over eleven years.

While the dryness of the atmosphere and the small rainfall have contributed to some extent to this result, yet the labors of local and State boards

of health and sanitary conventions have contributed in no small degree to the enforcement of sanitary measures, the prevention of disease, the promotion of health, and to the comfort and security of the people.

During the past quarter, the following changes have taken place in county health officers:

Dr. S. J. Bacon, of Yates Center, has been appointed Health Officer of Woodson county in place of Dr. E. K. Kellenberger; and Dr. C. L. Ebnother, of Hugoton, has been appointed Health Officer of Stevens county in place of Dr. A. L. Holloway. Dr. Ebnother writes, under date of August 18th, as follows:

"Inclosed find certificate issued by the County Clerk, to show my appointment as County Health Officer of Stevens county. If the people keep on leaving as they have been doing recently, there will be no demand for a health officer nor for a doctor in the county."

These two appointees apparently take hold of their offices with the determination to carry out as thoroughly as possible all sanitary measures that will be of practical benefit to the people.

The following is a brief summary of the quarterly reports received from the county health officers:

Crawford county reports 47 marriages, 49 births, and 57 deaths; of the deaths, 38 were under 5 years of age; the causes assigned for the deaths were as follows: 2 from cerebro-spinal meningitis, 4 from puerperal fever, 4 from typhoid fever, 1 from erysipelas, 1 from measles, 22 from diarrheal diseases, 2 from consumption, 1 from paralysis, 3 from disease of the brain, and 3 from accidents.

Graham county reports 1 case of typhoid fever, 2 of pernicious malarial fever, 1 of cholera morbus, and 3 of cholera infantum; and have had no epidemic in any form in any part of the county; that the general sanitary surroundings and condition of the public buildings were good. That the jail and poorhouse are new, roomy, and well conducted. At the beginning of the quarter I was informed that in many places dead animals had been drawn out and allowed to decay on the prairies; have tried to remedy this evil, and have succeeded.

Hodgeman county reports 3 marriages, 12 births, and 2 deaths; 1 from consumption, and 1 still-birth.

From Kearny county the following is reported: 3 marriages, 4 births, and 6 deaths; the latter under five years, and from cholera infantum. The general health of the county is surprisingly good; there has been very little sickness of any kind, while the general sanitary condition is excellent.

Lane county reports 11 births and 8 deaths; of the deaths, 2 were from typhoid fever, 1 from diphtheria, 1 from whooping-cough, 1 from heart disease; have had 15 cases of diphtheria in two families; the first family attacked with this disease had been using impure water from an open well, in which the water became so low that it was used for nothing except drinking

and cooking; water for other purposes being hauled from another well. The well was near the stable, and considerable filth was probably blown in by the wind, and washed in from the surface during the rains. The other family visited there with some of their children, before they knew what the disease was. In both cases they were living in leaky sod houses, with the floors very close to the ground, under which no air ever penetrated. Disinfectants and antiseptics were used as thoroughly as possible, which is not saying much, as the houses were small, the sick and the dead (when there were any dead) being in one room. The families were also large. The funerals were ordered to be private, and as soon after death as possible. At the present time the sanitary condition of the county is good.

Logan county reports that during the quarter there have been 50 cases of whooping-cough, 3 of typhoid fever, and 1 of cholera infantum; all of a mild type; the sanitary condition and the general health of the people throughout the county is good at the present time.

Phillips county reports as follows: 11 marriages, 10 births, and 11 deaths; 3 deaths were from heart disease, 2 from consumption, 1 from paralysis, 1 from diarrhea, and 1 from intestinal hemorrhage; mumps have prevailed to some extent, but we have no epidemics nor endemics; and the sanitary condition of the public buildings and the county is excellent.

The County Health Officer of Stanton county reports 3 births, and 1 death, and says that the general sanitary condition of this county is as good as can be found in the State. The high prairies, dry atmosphere, and good water, are conducive to good health and long life; just a little more rain at the right time, and this would be as prosperous as any other part of the State. There are four physicians in this county. I have the law requiring the physicians to report, published in our county papers; and I think in a short time it will have the desired effect in securing prompt and accurate returns.

Coffey county reported two cases of scarlet fever, and that the County Health Officer had isolated the cases, displayed the yellow flag, and excluded all visitors, and thought the disease would be communicated to no other person. The sanitary condition of the public buildings and the county in general is very good.

The Secretary of the Maine State Board of Health, under date of June 25th, reported a case of small-pox at Searsport, and stated that before the nature of the disease was known six persons were exposed to the case, and three of them contracted varioloid, making four cases, and that the local board of health was doing its duty.

Scarcely a day passes but what I receive letters from all professions and from all classes of people asking for copies of our reports. This morning's mail brought me nine letters requesting me to send a copy of the Fifth Annual Report; one was from Canada, one from Minnesota, one from Pennsylvania, one from Ohio, two from Missouri, and one from the Indian Territory.

The first three editions of our report are nearly exhausted, while the last two are in constant demand. Many letters of appreciation and commendation of the reports, and the work of the Secretary, are received. I will refer briefly to a few recently received.

Mr. Edward Jackson, of Philadelphia, Pennsylvania, and chairman of the Pennsylvania State Medical Society, writes as follows:

"Report of Kansas State Board of Health for 1889 duly received. Have been much interested in the report, and especially in the report of the Sanitary Convention at Lawrence. Such gatherings are certainly of great importance in awakening an interest in matters that should be a part in common-school instruction."

The following is from W. M. Edwards, of Colby. He was the first County Health Officer of Thomas county, and is now a retired physician. He says:

"Many thanks for the Fifth Annual Report. It is a pleasure to receive tokens from brethren of the profession, even when worn out with 52 years of professional life. I am 75 years old now, hale and strong. Have battled 50 years in medical life, and lived all the time with one woman, who is with me yet; and she is 71 years old. We have raised four sons and four daughters, and are all well settled; while we have never had a death in our household."

Dr. J. W. Light, formerly Health Officer of Kingman county, writes:

"I am in receipt of the Fifth Annual Report of the State Board of Health, for which please accept my most sincere thanks. I find much therein that is of great interest to me, and much valuable information that I could get nowhere else."

J. M. Waterman, Esq., editor of the *Delphos Republican*, writes:

"Please accept our thanks for the Fifth Annual Report of State Board of Health. It is a valuable document. By the way, can you inform me why our county, Ottawa, has no representation or report in your proceedings? We certainly should be interested in the matter of vital statistics."

And Dr. William B. Dewees, of Salina, writes as follows:

"I beg to acknowledge, with thanks, the receipt of the Fifth Annual Report of the State Board of Health. After carefully examining the same, I cannot refrain from expressing my opinion, in the highest degree, appreciative of your labors, *well done*, as the Secretary. The labor entailed in the execution of such a report can only be adjudged by one who has had experience in the issuing of reports, and book-making. Your individual articles on 'La Grippe,' and 'Know Thyself,' are worthy of high note, and should be generally read by the profession as well as those of the laity, who are philanthropically inclined. I cannot suppress my feelings of surprise in not finding any reports, or evidence of other work, from Saline county."

The following letter from Dr. Wiley, Health Officer of Wilson county, in reference to the analysis of a sample of suspicious water, taken from one of the city hydrants, explains itself:

FREDONIA, KAS., 7-14, 1890.

J. W. Redden, M. D., Topeka, Kansas—DEAR SIR: I inclose a copy of a communication which I have received from the Mayor and Council of the city of Fredonia. In pursuance of the same, according to your previous instructions I have prepared and expressed to Dr. Alexander a sample of the water taken from one of the hy-

drants of the city. The water is supplied to the city from an open reservoir, located one mile from the public square. The elevation is 160 feet, and the reservoir is divided by a twelve-inch brick wall through which the water filters before being distributed. The source of supply, ordinarily, is a well in the bank of Fall river, one and one-half miles from the reservoir. But at present the well does not furnish sufficient water, and a portion of it is pumped directly from the river, which has no current, being at the present low stage of water rendered stationary by a mill-dam located about one-half mile below the pump house. The river is covered with a green scum. The water company is under contract to furnish a supply of wholesome water, and as many of our citizens use hydrant water exclusively for culinary purposes, the request of the Council is reasonable and timely.

The sample marked "A" was taken from a private hydrant four blocks from the public square, and from which comparatively little water is used.

Hoping you will be able to supply analysis soon, I remain,

Respectfully yours,

F. M. WILEY, M. D.,

County Health Officer, Wilson County.

The following is the communication from the Mayor and Council of Fredonia, referred to in Dr. Wiley's letter:

To the Honorable Health Officer of the County of Wilson and the State of Kansas—
DEAR SIR: There having been many complaints made as to the purity of water now being used by the citizens of Fredonia, from the hydrants of the Fredonia Water Company, we hereby request that you have analyzed samples of said water as taken from said hydrants, and as used by said citizens, and report results as soon as ascertained. Yours very truly,

A. BUTCHART, Mayor,

Attest: R. J. JAMIESON, City Clerk.

S. J. BARTLETT, President of Council.

I requested Dr. Alexander to make a quantitative examination of the sample of water from Fredonia, and report the result of the analysis to me. The following is the report of Dr. Alexander:

TOPEKA, KANSAS, July 30, 1890.

Dr. J. W. Redden, Secretary Kansas State Board of Health, Topeka, Kansas— DEAR DOCTOR: Inclosed please find report of analysis of sample of water received from Fredonia, Kansas. Very truly yours,

REID ALEXANDER.

REPORT OF THE ANALYSIS OF A SAMPLE OF WATER, MARKED "A," FROM THE COUNTY HEALTH OFFICER OF FREDONIA, WILSON COUNTY.

| | <i>Grains per U. S. gallon.</i> |
|---|-------------------------------------|
| Organic matter..... | .250 |
| Silica | 1.166 |
| Alumina and oxide of iron..... | .750 |
| Bicarbonate of calcium and magnesium | 8.165 |
| Bicarbonate and sulphate of sodium and potassium..... | 6.824 |
| Chloride of sodium..... | 1.740 |
| Total solids..... | 18.895 |
| Chlorine (combined)..... | 1.050 |
| | <i>Parts per million.</i> |
| Free ammonia..... | .040 |
| Albuminoid ammonia..... | .120 |

The mineral ingredients of this water are excellent. The amount of albuminoid ammonia renders the water suspicious of contamination from drainage, although not present in sufficient quantity to absolutely condemn the water by most standards.

REID ALEXANDER, M. D.,

Chemist and Microscopist for the Kansas State Board of Health.

A true copy of this analysis was sent to Dr. Wiley.

I received the following letter from Dr. McKinney, Health Officer of Reno county, requesting a full analysis of a sample of water taken from the hydrants in their city, and which is suspected of being impure:

HUTCHINSON, KANSAS, August 30, 1890.

J. W. Redden, M. D., Topeka—DEAR SIR: I sent you yesterday, per express, a bottle of water for analysis. It was water from one of our city hydrants. We had been led to think that the water furnished by the city water works was as pure as water could be. It was so pronounced by our local chemist when we first began to use it. Our well is sixty feet deep, and is as carefully guarded from outside impurities and surface drainage as it looks possible to be done, and yet some of our people have an impression that it is not pure. At the request of our Mayor I sent you the sample, and I hope your chemist will give it a careful analysis.

I am not an expert on water, but it does seem to me that our people are as ignorant as myself, and perhaps more scary. There are many things in regard to water that I cannot account for. In crossing the Gulf of Mexico I had a long conversation with the captain of the vessel, a man of natural intelligence and an experience of 50 years on the sea. He informed me that water obtained from a pure spring, that looked pure and clear, would decompose and become offensive when put in a ship's water cask much quicker than the water from a river, even though muddy, and that an experience of fifty years in every port almost in the world he had found that the water from the Mississippi river at and below New Orleans would keep without becoming offensive in a ship's cask longer than any water in the world. We all know the Mississippi river drains more surface than almost any river in the world, and why should not its water, when near the delta, be completely loaded with organic matter?

Another point in my experience is, I am using ice made by our ice factory. I have visited the establishment, and observed its process. The water is vaporized, condensed and filtered, and one would naturally suppose this ice would be pure, and yet my refrigerator needs more cleaning with it, than when I use the pond ice. There is some reason for this, but I have never given it enough attention to know the reason.

The hydrant water may be pure, but our people complain, and our city dads wish to know for sure, and if needed and possible, remedy the condition.

Very respectfully, A. W. McKINNEY, M. D., *County Health Officer.*

The water was turned over to Dr. Alexander, who made the following quantitative report:

TOPEKA, KANSAS, September 11, 1890.

Dr. J. W. Redden, Secretary Kansas State Board of Health. Topeka, Kansas—DEAR DOCTOR: Inclosed please find report of analysis of sample water received from you September 8, 1890. Very truly yours, REID ALEXANDER, M. D.

ANALYSIS OF SAMPLE WATER RECEIVED FROM HUTCHINSON, KANSAS, SEPTEMBER 8, 1890.

| | Grains per U. S. gallon. |
|--|-----------------------------|
| Organic matter..... | .200 |
| Silicic acid..... | 5.132 |
| Carbonate of calcium..... | 11.897 |
| Carbonate of magnesium..... | .632 |
| Carbonate of sodium and potassium..... | 2.225 |
| Sulphate potassium..... | 6.927 |
| Chloride sodium..... | 5.412 |
| Total solids..... | 32.425 |
| Free ammonia..... | Parts per million. .030 |
| Albuminoid ammonia..... | .120 |

The amount of albuminoid ammonia present in this water renders it suspicious of contamination, but it is not present in sufficient quantity to condemn the water. The mineral ingredients are good. By proper care this could be made a good water.

REID ALEXANDER, M. D.,

Chemist and Microscopist of Kansas State Board of Health.

A true copy of said analysis was sent to Dr. McKinney.

Dr. Emerson, County Health Officer of Cowley county, at the request of the City Council of Winfield, sent four samples of water, with the request that I have them thoroughly analyzed, and send him true copies of the analyses. I had Prof. Church make the analyses. As all of the correspondence in reference to the said analyses of samples from Winfield was made through me officially, for reasons satisfactory to them; I have thought proper to include them in my quarterly report. All the expense attending these analyses was paid by the city of Winfield. The following are the reports from Prof. Church:

TOPEKA, KANSAS, JUNE 9, 1890.

Dr. J. W. Redden, Secretary State Board of Health, Topeka, Kansas—DEAR SIR: Inclosed herewith please find analyses of water, Nos. 1, 2, 3 and 4, from Winfield, Kansas, received at your hands Thursday, June 5th, in unopened express box. Samples were tightly corked and sealed, and seals broken by me:

NO. 1, HYDRANT IN TRIBUNE OFFICE, WINFIELD, KANSAS, JUNE 2, 1890.

| | Grains per U. S. gallon. |
|---|-----------------------------|
| Organic matter..... | .300 |
| Silica, alumina, and iron oxide..... | .750 |
| Bicarbonate of calcium..... | 9.200 |
| Bicarbonate of magnesium..... | 2.500 |
| Bicarbonate of sulphates of sodium and potassium..... | 16.122 |
| Chloride of sodium..... | 1.453 |
| Total solids..... | 30.325 |
| Chlorine (combined)..... | .877 |
| | Parts per million. |
| Free ammonia..... | .350 |
| Albuminoid ammonia..... | 260 |

NO. 2, HYDRANT AT ALEXANDER HOUSE, SOUTH CHURCH STREET, WINFIELD, KANSAS, JUNE 2, 1890.

| | Grains per U. S. gallon. |
|--|-----------------------------|
| Organic matter..... | .295 |
| Silica, alumina and oxide of iron..... | .725 |
| Bicarbonate of calcium..... | 9.000 |
| Bicarbonate of magnesium..... | 2.400 |
| Bicarbonate and sulphates of sodium and potassium..... | 14.898 |
| Chloride of sodium..... | 1.522 |
| Total solids..... | 28.840 |
| Chlorine (combined)..... | .914 |
| | Parts per million. |
| Free ammonia..... | .060 |
| Albuminoid ammonia..... | .240 |

NO. 3, HYDRANT IN HUNTER'S DRUG STORE, WINFIELD, KANSAS, JUNE 2, 1890.

| | Grains per U. S. gallon. |
|--|-----------------------------|
| Organic matter..... | .300 |
| Silica, alumina and oxide of iron..... | .725 |
| Bicarbonate of calcium..... | 9.175 |
| Bicarbonate of magnesium..... | 2.475 |
| Bicarbonate and sulphates of sodium and potassium..... | 15.734 |
| Chloride of sodium..... | 1.591 |
| Total solids..... | 30.000 |
| Chlorine (combined)..... | .951 |

| | <i>Parts per million.</i> |
|-------------------------|---------------------------|
| Free ammonia..... | .140 |
| Albuminoid ammonia..... | .180 |

NO. 4. HYDRANT AT F. MANNY'S, WINFIELD, KANSAS, JUNE 2, 1890.

| | <i>Grains per U. S. gallon.</i> |
|--|-------------------------------------|
| Organic matter..... | .290 |
| Silica, alumina and oxide of iron..... | .760 |
| Bicarbonate of calcium..... | 9.400 |
| Bicarbonate of magnesium..... | 2.450 |
| Bicarbonate and sulphates of sodium and potassium..... | 14.875 |
| Chloride of sodium..... | 1.384 |

| | |
|--------------------------|--------|
| Total solids..... | 29.159 |
| Chlorine (combined)..... | .840 |

| | <i>Parts per million.</i> |
|-------------------------|---------------------------|
| Free ammonia..... | .120 |
| Albuminoid ammonia..... | .140 |

Samples Nos. 1, 2, and 3 are condemned for drinking purposes, on account of the pollution from animal and vegetable decomposition, as indicated by the amount of albuminoid ammonia and organic matter found therein.

No. 4 would be condemned by most standards, and is very near the line at which it would be condemned by the most lenient standards, that place the line at .150 parts per million of albuminoid ammonia. The variation in the amount of nitrogenous organic matter, as indicated in the albuminoid ammonia, could be accounted for by those familiar with the locations, and is probably due to the fact that the water at some of the hydrants has not been used as freely as at other points, or that the pipes and mains in some localities has become coated with organic scales from which the water is polluted. Yours respectfully,

W. D. CHURCH, P. C.

A true copy of this report was sent to Dr. Emerson. On June 26 and August 20 two other samples were received from him, with the request that they also be carefully examined by the same chemist and the reports sent to him.

The following are the analyses of these two samples, made by Prof. Church, and sent to Dr. Emerson for Winfield:

TOPEKA, KANSAS, JUNE 26, 1890.

Dr. J. W. Redden, Secretary of the State Board of Health, Topeka, Kansas—DEAR SIR: Inclosed herewith please find analysis of water received at your hands, June 25, marked, "Hydrant water taken from tap in Hunter's drug store, Winfield, Kansas, June 21, 1890." Sample was sealed when received, and the seals were broken by me.

| | <i>Grains per U. S. gallon.</i> |
|---|-------------------------------------|
| Organic matter..... | 1.500 |
| Insoluble matter..... | 69.600 |
| Oxide of iron and alumina..... | 2.000 |
| Bicarbonate of calcium..... | 10.500 |
| Bicarbonate of magnesium..... | 2.750 |
| Bicarbonate and sulphate of sodium and potassium..... | 18.306 |
| Chloride of sodium..... | 1.450 |

| | |
|-------------------|---------|
| Total solids..... | 106.106 |
|-------------------|---------|

| | |
|------------|------------|
| Odor..... | Offensive. |
| Color..... | Dark. |

| | <i>Parts per million.</i> |
|--------------------------|---------------------------|
| Free ammonia..... | .180 |
| Albuminoid ammonia..... | .900 |
| Chlorine (combined)..... | .877 |

This water is condemned absolutely for drinking purposes, as unwholesome and dangerous. In the amount of its nitrogenous organic matter it shows pollution approaching that of sewer water. The large amount of insoluble matter is largely due to the presence of sulphide of iron, caused by the action of the organic matter on the iron pipes.

Yours respectfully,

W. D. CHURCH, P. C.

TOPEKA, KANSAS, August 20, 1890.

Dr. J. W. Redden, Secretary State Board of Health—DEAR SIR: Inclosed herewith please find report of analysis of sample of water received from you August 18, 1890, marked "Water from tap in Hunter's drug store, Winfield, August 15th":

| | Grains per U. S. gallon. |
|---|--------------------------|
| Organic matter..... | 1.000 |
| Silica..... | 1.399 |
| Alumina and oxide of iron..... | .500 |
| Bicarbonate of calcium..... | 12.000 |
| Bicarbonate of magnesium..... | 1.500 |
| Bicarbonate and sulphate of sodium and potassium..... | 8.335 |
| Chloride of sodium..... | 1.392 |
| Total solids..... | 26.126 |
| Chlorine (combined and free)..... | .840 |
| | Parts per million. |
| Free ammonia..... | .080 |
| Albuminoid ammonia..... | .240 |
| Nitrates: Considerable. | |

This is unwholesome drinking water, and is condemned for potable purposes, on account of the large amount of nitrogenous organic matter as shown by the aluminoid ammonia and nitrates.

Yours respectfully,

W. D. CHURCH, *Chemist*.

The following information in reference to la grippe is worthy of attention:

THE ANCIENT IRISH GRIPPE.—Influenza, according to the Irish Local Government Board, is an old acquaintance in Ireland, says the *London Daily News*. A passage is quoted from the "Annals of Ulster," A. D. 1326: "Awful thunder and lightning this year, which destroyed the corn and produce of Erin, so that it was blanché and waste. An epidemic disease, common throughout all Erin, which was called "slaedan" (prostration, influenza,) which affected during three or four days every person, so it was second only to death." In 1328 influenza is recored under the name of "slaedan" in the "Annals of the Four Masters," and in the "Annals of Connaught," and under the name of "murre" in the "Annals of Clonmacheise." Several outbreaks of influenza are mentioned in the fourteenth century in Ireland. In 1580 the same disease is described as a strange kind of sickness, called "the gentle correction," or influenza.

It is worthy of our consideration to notice the grand results from vaccination throughout the German empire: Under the law of Germany, making vaccination compulsory and providing for re-vaccination at stated periods of life, small-pox is almost completely disappearing from the German empire. A late official report states that in 1888 only 110 deaths from small-pox occurred in the whole empire, and that this number is 58 fewer than occurred in 1887, and 87 fewer than in 1886. Of 110 deaths, 88, or about four-fifths of the whole number, occurred in those parts of the empire im-

mediately bordering other countries not well protected by vaccination, and in which there is constant intercourse between vaccinated and the unvaccinated sides of the boundary. More than one-third of all the deaths occurred in the Prussian province of Posen. Comparing the small-pox death-rate of the large cities of other countries with that of the larger cities of Germany, it was 136 times as great in the cities of Austria, 30 times as great in those of Hungary, 16 times as great in those of England, 24 times as great in those of Belgium, and twice as great in those of Switzerland, as in the German cities.

As cholera is at the present time engaging the close investigation of our best sanitarians on both continents, I thought it important to give the latest facts in reference to the history and progress of this most remarkable plague:

CHOLERA IN JAPAN, 1884 TO 1887.

Although no year since 1877 has been free from cholera, there has been considerable difference in the virulence of the disease. The year 1884 was characterized by the mildness of the form prevailing; the number of cases, too, were less than in the preceding year. This dreadful malady made its appearance at Nagasaki toward the end of July, 1885. It raged with great severity in different localities of Kyushu for over a month, and then made its way eastward.

Though suppressed for a time, it made its appearance again in 1888, when it assumed the form of a violent epidemic, spreading far and wide, reducing the country to a state of misery that had not been known since 1877. Such a degree of severity may be attributable to the development of the poisonous germs that lay dormant in the previous year.

Subsequent to the first outbreak of cholera this year, the local authorities had been most punctual in inspecting travelers by land and sea, and had endeavored by every possible means to suppress the disease, but in spite of these efforts it spread all over parts of the empire.

During the four years from 1884 to 1887, there were 171,879 cases of cholera and 118,809 deaths; 166,456 cases of enteric fever and 36,261 deaths; 11,041 cases of diphtheria and 5,600 deaths; 16,473 cases of typhus fever and 2,825 deaths; and 127,576 cases of small-pox and 32,382 deaths.

The above statistics show that the cholera cases far exceed those from any other infectious or contagious disease.

CHOLERA IN THE EAST IN 1890.

The statements contained in the following communication, addressed by Doctor Gabuzzi to the French Society of Hygiene, are fully confirmed by the published reports of the cholera epidemic in the East:

CONSTANTINOPLE, July 17, 1890.

"The sporadic cases of cholera reported to the sanitary administration from Mardin, Djerire, and the villages of Vahsa and Telkine, under date of July 2, and which were declared by the military physicians, after careful investigations, to be

cases of 'pernicious fever and typhus, caused by the injection of poisonous plants,' were, on the contrary, the first appearance of a new choleraic epidemic, or probably a fresh outbreak of the epidemic suddenly suppressed at Mossoul last year by the cold of winter and the difficulty of communication.

"Europe is now more seriously menaced than ever. The epidemic is in the aggressive stage. The sanitary administration reports from official information as follows:

| <i>Provinces.</i> | <i>Dates.</i> | <i>Cases.</i> | <i>Deaths.</i> |
|-------------------|--------------------|---------------|----------------|
| Messoul..... | From July 6 to 12. | 152 | 84 |
| Diarbekir..... | From July 6 to 12. | 120 | 110 |
| Bitlis..... | July 5. | 10 | 3 |

"The progress of the epidemic to the north is indubitable. Its route will probably be by Ezeroum and Trelirzonde to the littoral of the Black Sea."

MADRID, Aug. 7.—Cholera has broken out here. Great excitement prevails. Hundreds are preparing to leave the city. A panic is imminent. Several deaths from cholera occurred this morning, and confusion reigns.

LONDON, Aug. 7.—One hundred deaths occur daily from cholera at Jeddah, Egypt.

LONDON, Aug. 12.—One hundred and seventeen persons died from cholera in Mecca yesterday; in Jeddah seventy-nine died.

SAN FRANCISCO, Aug. 14.—Cholera has broken out on the Turkish frigate Esten-grove, at Yokohama. A cholera epidemic is rapidly gaining ground. Three hundred and three cases and seventy-nine deaths have been reported in Negasakitsen. Cholera is also reported at Yokohama and other Japanese cities.

CAIRO, Aug. 15.—Three cases of cholera have been discovered here. One has already proved fatal. The appearance of the disease has caused intense excitement. People of all classes are making hurried preparations to depart.

ALARMING AND FATAL PROGRESS OF THE DISEASE IN JAPAN.

Judging from the newspaper accounts, Japan is now sadly afflicted with cholera. This plague does not seem to be located in any particular town or district, but is epidemic all over the realm. The daily bulletins of the newspapers show that in the smaller villages new cases are discovered at the rate of three and four in twenty-four hours, and in the larger cities the epidemic has reached alarming proportions. The disease seems to be more fatal this year than in former years. Many ports are in quarantine, and all efforts are being made to check the disease. Those afflicted number into the hundreds. In one city the total number of cases up to July 30th reached 195, of which 98 were fatal. In another there were on the same date 72 cases and 39 deaths. These are but samples of the ravages of the disease which is known as Asiatic cholera. Where it will end is hard to predict. Business and commerce suffer greatly in consequence. When the Oceanic sailed, over 3,000 cases were reported, and it is believed that 60 per cent. proved fatal. The Government is trying to arrest its progress. Their Majesties, the Emperor and Empress, have granted 1,000 yen and 5,000 yen, respectively, to the Japan Sanitary Association, which gives medical assistance gratuitously to persons attacked by cholera.

Now, in conclusion, allow me to suggest to the President the advisability and importance of appointing members of the Board as special Sanitary Committees during this meeting, to visit the Insane Asylum and Reform

School, at Topeka, the Institute for the Blind, at Kansas City, Kansas, and the Deaf and Dumb Institute at Olathe, make thorough and careful investigations of the sanitary condition and surroundings of the buildings, the ventilation and heating, and source and quality of the water-supply, and present their conclusions in a full and special report to this Board, at its December session. It is also recommended that the President appoint two delegates and two alternates to attend the eighteenth annual meeting of the American Public Health Association, to be held early in December in Charleston, South Carolina.

Respectfully submitted.

J. W. REDDEN, M. D., *Secretary*.

SECRETARY'S FOURTH QUARTERLY REPORT.

MR. PRESIDENT, AND GENTLEMAN: The sixth calendar year since the organization of the State Board of Health is drawing to a close. The labors of the State and county health boards and their efforts to prevent disease, control epidemics, suppress contagious diseases, and promote the health of the public, have been attended with better results, and have been more generally appreciated by the people. The pamphlets, circulars and leaflets issued by the State Board, and generally distributed for educational purposes and general information, are continually growing in popular favor, are sought after by families, freely published by the press, and read by the masses; and consequently have become educators of great value.

The present year has been noted throughout the State for the general good health of the people, the freedom from epidemics, the mildness of disease, and the low death-rate; while the farming community have been blessed with bountiful provisions, commanding excellent prices; thus rendering homes not only healthy, but happy.

The sanitary conventions have been growing in interest, importance and value; while the people in general are being convinced, and soon must appreciate the force and importance of the well-established truth, that the health of the people is the supreme law. During the past quarter there have been no changes reported among the county health officers—an unusual event; while the people appreciate more than ever the importance of their positions, and encourage their efforts for sanitary reform and progress.

Eighty-three of the counties have efficient and active local health officers, while most of the other counties are doing something in the line of sanitation and preventive medicine.

While all that was desired has not been accomplished, and while the power of the Board is limited, yet sure and steady progress has been made. The people are being educated to understand the scope and purpose of the health boards, show more sympathy with health officers, and are more willing to aid in enforcing all necessary rules and regulations issued by the

health authorities. Since the last meeting of the Board, the special committees appointed for visiting the State charitable institutions, and thoroughly examining their sanitary condition, systems for ventilation, heating, sewerage, purity of the water-supply, etc., have executed their trusts and made reports, which will be submitted to the Board at this session, for its consideration and indorsement.

The county health officer of Crawford county reports for the present quarter, 68 marriages, 37 births, and 81 deaths, as follows: Two from measles, 5 from cerebro-spinal meningitis, 3 from diphtheria, 12 from typhoid fever, 18 from diarrheal diseases, 3 from consumption, and 4 from acute lung diseases.

Jewell county reports 9 cases of measles, 75 of whooping-cough, 25 of scarlet fever, 42 of diphtheria, 40 of dysentery, and 15 of typhoid fever; also 26 marriages, 17 births, and 18 deaths; that the sanitary condition of the county is steadily improving; as the people become more thoroughly educated in sanitary matters, they strive to keep pace with sanitary improvement; have had no epidemics in the county of contagious diseases during the past six months. Scarlet fever made its appearance in Mankato a short time since, but by prompt action on the part of the physicians and the people in enforcing proper sanitary measures, it was confined to three families, and no death occurred. It has now disappeared.

Logan county reports 20 cases of whooping-cough, 25 of cholera infantum, 10 of dysentery, and 1 of typhoid fever. The sanitary condition is excellent. These are fair samples of reports received from the various counties.

From Dr. E. Pelletier, Secretary of the Montreal Provincial Board of Health, under date of November 15th, I was notified that a case of small-pox had been landed at Grosse-Isle quarantine.

On November 1st, I was notified by Dr. Benjamin Lee, Secretary of the Pennsylvania State Board of Health, that a case of leprosy exists at Chester, Delaware county, in the person of John Anderson. He has been a resident of Chester for three years; left Sweden 15 years ago, sailing to and from United States and the West Indies in fruit vessels about 10 years. Isolation in Delaware pest-house.

From one of the members of the State Board of Health, I received recently the following communication:

"DOCTOR: I am liable to get into a little 'sanitary squabble' out in the country in a few days, and would like to know about what my authority is in the premises. Complaint is made that a certain farmer's premises are in such a condition that the stench is very offensive to the neighbors, and some sickness is starting up in the neighborhood. The complainants say his hog-pen is under the house, and the children, when they come to school are so filthy that the rest of the school can hardly stand it. Now what can I do?"

I wrote him that the premises were a public nuisance, and that the neighbors had a remedy under the general statutes, and that a complaint to the county attorney should speedily result in the removing or abatement of

the nuisance. As I heard nothing more, I presume the remedy was effectually applied.

Since our last meeting, I received from a physician the following letter:

"We have a draw that drains the eastern part of our city, and passes through our town, draining most of the surplus water and filth of the place. It carries the filth from hog-pens, privies and barns. Mr. — has thrown up a dam and made a pond in this city on one of his lots: the water is stagnant, contains the filth and retains it; the water has yellow and green scum over it, and some of the families who breathe the air from the pond, are afflicted with malaria. We have no health officer in the county, and our town officers are timid in the matter; it is certainly causing sickness in localities here. Is not this affair under your control, there being no health officer in our county? We have a population of 1,300. I wish you would look the matter up and act at once. He refuses to open the dam. I may say that I am having malaria the first time for twenty years. It is certainly a nuisance, and should be so declared. I do not wish to have trouble in the matter, nor to be quoted, unless it really becomes necessary, but I make complaint.

"Yours for health, and in favor of the grand old Republican party,

—— ———, M. D."

I replied to him about the same as to the former correspondent, and presume the nuisance was abated and proper relief obtained, as I heard nothing more from that locality.

Each of these two counties had county health officers for a few years, but as they performed so much labor for so little remuneration, the county commissioners decided to abolish the office; no doubt thinking their constituents would approve of their action, under the pretext of retrenchment and reform; but a few such examples as above described ought to awaken the people to the necessity of demanding the appointment of health officers, and the prompt enforcement of sanitary measures for the people's benefit and protection. Recently I received from a prominent physician, and formerly county health officer, the following communication:

"DEAR DOCTOR: Last week I received a copy of the Fifth Annual Report of the State Board of Health, for which please accept my heartiest thanks. I earnestly hope that the Legislature will give us a law this coming winter, that will give both State and local boards of health the needed sanitary power; then I think this county would fall into line with all the others in enforcing it. Please let me know what bill will come up before the Legislature, and I will try and get the member from this county pledged to its support.

"Yours truly,

—— ———, M. D."

Only a few days ago I received the following note from Dr. E. M. Hunt, Secretary of the New Jersey State Board of Health, and one of the leading sanitarians in the country:

"DEAR DOCTOR: I have just finished an examination of your Fifth Annual Report, and find it one of unusual value."

As a sample of the value and benefits resulting from the distribution of our pamphlets on the prevention and restriction of dangerous communicable

diseases, I give you the following brief notes. A prominent physician in Osage county, writes:

"DEAR DOCTOR: Please send me by next mail a few more scarlet fever pamphlets, they are going to do us good in stopping the spread of the disease here.

—, M. D.

Three weeks after this the same physician writes thus:

DEAR DOCTOR: I received the scarlet fever pamphlets in due time, and have distributed them. It has been two weeks since the last case developed, and I have begun to feel that we have the disease under control. Thanks.

—, M. D.

During the present year but two cases of small-pox have occurred in the entire State, so far as is known to the State Board of Health. These two cases were of the modified form—varioid—were children of the same family, and lived in an eastern suburb of the city of Topeka. They were promptly diagnosed, at once isolated and quarantined, and all proper precautionary measures enforced by the City Board of Health, and no other cases were communicated or developed from them. The origin of the disease is uncertain. The premises are being thoroughly disinfected, and the patients will be discharged in a few days. The county health officer is preparing a full report, and will have it ready in a few days, which will be published in the Sixth Annual Report of the State Board of Health.

On September 25th, I received the following interesting communication from Dr. George Homan, Secretary of the Missouri State Board of Health:

ST. LOUIS, Mo., September 27, 1890.

J. W. Redden, Secretary State Board of Health, Topeka, Kas.—DEAR DOCTOR: Can you give me any information concerning the moral character and professional standing of Dr. M., late of ——— City, your State, now of Joplin, Mo.? He applies for registration, and submits a letter of recommendation signed by ———, M. D., and ———, M. D., both of former place. Are they in good standing professionally, as far as you know? I hope everything is going well with you personally, and that the Board is flourishing.

Yours truly,

GEORGE HOMAN, Secretary.

I wrote to Dr. E., the County Health Officer, and received the following letter, and Dr. Homan was immediately furnished with a copy of it:

J. W. Redden, M. D., Topeka, Kansas—DEAR DOCTOR: I have never heard anything against the moral character of either of these three men. M. was a great advertiser, general blowhard, and not an average country practitioner in medical knowledge and ability; was not recognized by regular physicians and honest practitioners of any school. W. is good for nothing, ignorant, incompetent, and dishonest; is now under a cloud through being mixed up in an abortion case that is now pending in the courts. Dr. C. is a pretty good man and physician; does a good business, and sustains himself well. He is inclined to be windy, and is an advertiser in S—H— fashion. I send you his picture, which is familiar to every one in this section, through public print.

Very respectfully,

—, M. D., County Health Officer.

A few days since I received from the secretary of the Leavenworth City Board of Health the following notice for contagious diseases, which has been recently adopted by said city board of health. It is a movement in

the right direction, and similar forms should be adopted and rigidly enforced by every city and county health board throughout the State:

CONTAGIOUS DISEASE CERTIFICATE.

No child who has had any contagious disease, or who resides in, or has visited, any building where such disease has existed, may return to school until all contagion has been removed from his person and from the building. The rooms occupied by the patient, and all bedding and clothing exposed to the contagion, should be thoroughly fumigated after the recovery of the patient. The attending physician will please fill out the following certificate.

BY ORDER OF THE BOARD OF EDUCATION.

LEAVENWORTH, KAS., ———, 189—.

This is to certify that ——— is free from the contagion of ———, and that ——— return to school would not endanger the health of the pupils by returning to school.

Has the bedding and clothing in the building been thoroughly fumigated since the recovery of the patient? ——— ———, *Attesting Physician.*

The following is a copy of the invitation and program for the Fifth Annual State Sanitary Convention; one thousand copies were printed; six hundred of them distributed to county health officers, physicians, and sanitarians in this State; two hundred copies sent to physicians and sanitarians and State health boards in other States; and two hundred copies retained for use at the convention:

INVITATION AND PROGRAM FOR THE FIFTH ANNUAL STATE SANITARY CONVENTION,
To be held under the auspices of the State Board of Health, in Manhattan, Kas., Dec. 4-5, 1890.

The admission to all sessions of the Convention will be free, and the ladies are cordially invited. All health officers, sanitarians and physicians are expected to be present. Every one is invited to take part in the discussions.

The first two and the last sessions of the Convention will be held in the G. A. R. hall; while the afternoon session will be held in the chapel of the State Agricultural College.

PROGRAM.

First Session—Thursday, December 4, at 7:30 p. m.

1. Convention called to order by the President.
2. Music.
3. Invocation.—By Rev. J. A. Swaney, D. D.
4. Address of Welcome.—By Judge R. B. Spilman, of Manhattan.
5. Response.—By Hon. John G. Mohler, President of the Convention.
6. Statement of the object of the Convention.—By G. H. T. Johnson, M. D., of Atchison, President of the State Board of Health.
7. The Water-Supply of Manhattan.—By Geo. E. Hopper, Esq., of Manhattan.
8. Sanitary Budget and Household Gems.—By J. W. Redden, M. D., of Topeka, Secretary of the State Board of Health.
9. Healthful Homes.—By H. S. Roberts, M. D., of Manhattan.
10. School Hygiene.—By Prof. John M. Bloss, of Topeka, Superintendent of the City Schools.
11. Music.

Second Session—Friday, December 5, at 9 a. m.

1. Personal Hygiene, as to Habits Formed.—By J. W. Jenney, M. D., of Salina, member of the State Board of Health.
2. The Proper Education of Women.—By R. C. Musgrave, M. D., of Grenola, member of the State Board of Health.

3. Nuisances: What They Are, and How to Abate Them.—By H. C. Irish, Esq., of Manhattan.

4. Sanitation; Its Object and Scope.—By R. A. Williams, M. D., of Olathe, member of the State Board of Health.

5. The Relation of Micro-Organisms to Disease.—By Prof. N. S. Mayo, of the State Agricultural College, Manhattan.

6. Water Purification.—By Col. William Tweeddale, C. E., of Topeka.

Third Session—Friday, December 5, at 1:30 p. m.

1. Music.

2. Hygiene of the Teeth.—By Frank Swallow, M. D., of Valley Falls, member of the State Board of Health.

3. Intoxicants and Health.—By Rev. D. C. Milner, D. D., of Manhattan.

4. Personal Hygiene as to Fluids Drunk, Foods Eaten, and Clothing Worn.—By D. C. Jones, M. D., of Topeka, member of the State Board of Health.

5. The Examination of Drinking Water.—By Prof. G. H. Failyer, of the Agricultural College, Manhattan.

6. Sanitation in Relation to Crime.—By Hon. R. A. Sankey, of Wichita.

7. The Work and Wants of the State Board of Health.—By H. D. Hill, M. D., of Augusta, member of the State Board of Health.

8. Music.

Fourth Session—Friday, December 5, at 7:30 p. m.

1. Music.

2. The Hygienic Prevention of Zymotic Diseases.—By J. Milton Welch, M. D., of Wichita, member of the State Board of Health.

3. Store-Room Food.—By Prof. Nellie S. Kedzie, of the State Agricultural College, Manhattan.

4. The Relation of Alcoholics to Preventive and State Medicine.—By W. L. Shenck, M. D., of Topeka, member of the State Board of Health.

5. Measures for the Prevention of Pulmonary Phthisis.—By Prof. E. W. Shaufler, M. D., of the Kansas City Medical College.

6. Light in the School-Room.—By Prof. J. D. Walters, of the State Agricultural College, Manhattan.

7. Reports of Committees, Resolutions, and Miscellaneous Business.

8. Remarks by the officers and visitors of the Convention.

9. Music.

The public are cordially invited to attend each session of the Convention.

Opportunity will be given for anyone to discuss the papers presented to the Convention.

Authors of papers are requested to limit them to twenty minutes. Each speaker in discussing any paper will be limited to five minutes. All papers, after being presented to the Convention, are to be handed to the Secretaries for publication.

The Higginbotham House and Commercial Hotel will entertain delegates at \$2 per day.

It is hoped that the papers of the State will be represented by their reporters.

Distribute extra copies of this program, and preserve them for use at the Convention.

The following resolutions, in reference to infection and contagious diseases, were adopted by the National Conference of State Boards of Health, at Toronto, October 6, 1886:

Whereas, It is necessary for the protection and preservation of the public health that prompt information should be given the existence of cholera, yellow fever, or small-pox, be it

Resolved, That it is the sense of the National Conference of the State Boards of Health, that it is the duty of each State and Provincial board of health within whose jurisdiction any of said diseases may occur, to furnish immediate information of

the existence of such diseases to boards of health of the neighboring States and Provinces, and to local boards in such States as have no central board, in which the duty of notification shall lie upon the local boards.

2. That upon the prevalence of rumor of the existence of pestilential diseases in any State or Province, if positive, definite information thereon be not obtainable from the proper health authorities, this conference holds that the health officials of another State are justified in entering the before-mentioned State or Province for the purpose of investigating and establishing the truth or falsity of such reports.

3. That whenever practicable, the investigations undertaken under the preceding section shall be made with the coöperation of the State or local authorities.

4. That any case which presents symptoms leading to serious suspicion of the existence of one of the aforesaid diseases, shall be treated as suspicious and reported as provided for in cases in which the diagnosis is certain.

5. That any case respecting which reputable and experienced physicians disagree as to whether the disease is or is not pestilential shall be reported as suspicious.

6. That any suspected case respecting which efforts are made to conceal its existence, full history, and true nature, shall be deemed suspicious and so reported.

7. That in accordance with the provisions of the foregoing resolutions, the boards of health of the United States and Canada represented at this conference do pledge themselves to an interchange of information as herein provided.

The following resolutions, explanatory of the above, were adopted by the National Conference of the State Boards of Health, at Washington, September 3, 1887:

Resolved, 1. That the conference reaffirms the principles contained in the resolutions adopted by its meeting in Toronto, in 1886.

2. That the communicable diseases hereinafter mentioned, prevalent in certain areas, or which tend to spread along certain lines of travel, be reported to all state and provincial boards within said area or along said lines of communication.

3. That in the instance of small-pox, cholera, yellow fever, and typhoid fever, reports be at once forwarded, either by mail or telegraph, as the urgency of the case may demand; and further, that in the instance of diphtheria, scarlatina, typhoid fever, anthrax, or glanders, weekly reports, when possible, be supplied, in which shall be indicated, as far as known, the place implicated and the degree of the prevalence.

The city of Hutchinson desired to have analyzed several samples of water in order to test its ingredients, the report to be used in evidence in a case in court against said city. As they were sent to me with the request that I have them analyzed by a competent chemist, who would be subpoenaed as a chemical expert, I thought best to preserve and submit samples of said analyses. They were analyzed by Prof. Church, and the expenses of the analyses paid for by the city of Hutchinson. The following are copies of the letter from the city engineer, and the analyses of the four samples of water, as made by Prof. Church:

HUTCHINSON, KANSAS, October 10, 1890.

J. W. Redden, M. D., Topeka, Kansas—DEAR SIR: I forward to-day, by U. S. express, one box containing five samples of water to be analyzed. Four are taken from Cow creek, "A," "B," "D," and "C," in order—down the creek, above, between, and below the outlets of our sewers. "E" is sewage from the packing-house sewer. "A" and "C" are same as sent you by Dr. McKiuney, of this city,

some time ago, and were not analyzed. Please have analyses made as soon as possible and send result to me; also bill. The city was ordered yesterday to be prepared to defend itself in court on the 17th inst. We will probably want Mr. Church as an expert witness. Again I ask you to have this matter pushed through as soon as you can.

Yours truly,

F. H. CARPENTER, *City Engineer.*

TOPEKA, KANSAS, October 13, 1890.

Dr. J. W. Redden, Secretary State Board of Health, Topeka, Kansas — DEAR SIR: Herewith please find reported analyses of five samples of water received at your hands October 11th, 1890, marked A, B, C, D, and E. Samples were sealed and corked with new corks, and the seals broken by me.

| SAMPLE A. | | Grains per U. S. gallon. |
|--------------------------------|--|-----------------------------|
| Organic matter..... | | .330 |
| Silica | | 3.966 |
| Alumina and oxide of iron..... | | 2.333 |
| Bicarbonate of calcium..... | | 9.163 |
| Sulphate of calcium..... | | 5.860 |
| Bicarbonate of magnesium..... | | 1.520 |
| Sulphate of sodium..... | | .500 |
| Chloride of sodium..... | | 7.620 |
| Total | | 31.292 |
| Chlorine (combined)..... | | 4.619 |
| | | Parts per million. |
| Free ammonia..... | | .030 |
| Albuminoid ammonia..... | | .200 |
| SAMPLE B. | | Grains per U. S. gallon. |
| Organic matter..... | | .350 |
| Silica | | 4.150 |
| Alumina and oxide of iron..... | | 2.449 |
| Bicarbonate of calcium..... | | 9.113 |
| Sulphate of calcium..... | | 6.150 |
| Bicarbonate of magnesium..... | | 1.595 |
| Sulphate of sodium..... | | .501 |
| Chloride of sodium..... | | 8.350 |
| Total..... | | 32.658 |
| Chlorine (combined)..... | | 5.039 |
| | | Parts per million. |
| Free ammonia..... | | .040 |
| Albuminoid ammonia..... | | .210 |
| SAMPLE C. | | Grains per U. S. gallon. |
| Organic matter..... | | 1.000 |
| Silica..... | | 3.466 |
| Alumina and oxide of iron..... | | 2.020 |
| Bicarbonate of calcium..... | | 9.105 |
| Sulphate of calcium..... | | 5.400 |
| Bicarbonate of magnesium..... | | 1.530 |
| Sulphate of sodium..... | | .321 |
| Chloride of sodium..... | | 8.350 |
| Total..... | | 31.192 |
| Chlorine (total)..... | | 6.298 |
| | | Parts per million. |
| Free ammonia..... | | 1.500 |
| Albuminoid ammonia..... | | .600 |
| SAMPLE D. | | Grains per U. S. gallon. |
| Organic matter..... | | .830 |
| Silica | | 4.050 |
| Alumina and oxide of iron..... | | 2.550 |
| Bicarbonate of calcium..... | | 9.613 |
| Sulphate of calcium..... | | 6.250 |

| | |
|---------------------------------|---------|
| Bicarbonate of magnesium..... | 1,580 |
| Sulphate of sodium..... | .501 |
| Chloride of sodium..... | 8,350 |
| Total..... | 33,824 |
| Chlorine (total)..... | 6,298 |
| <i>Parts per million.</i> | |
| Free ammonia..... | .800 |
| Albuminoid ammonia..... | .400 |
| <i>Grains per U. S. gallon.</i> | |
| SAMPLE E. | |
| Total mineral salts..... | 209.944 |
| Organic matter..... | 138.797 |
| Chlorine (total)..... | 79.780 |
| <i>Parts per million.</i> | |
| Free ammonia..... | 6,000 |
| Albuminoid ammonia..... | 4,500 |

Samples Nos. A and B show sufficient organic matter and albuminoid ammonia to condemn them for table purposes by the usual standards, but do not show any evidence of direct contamination by sewage.

Samples C and D are strongly polluted by sewage, as is shown by the large amount of free ammonia, and the increased amount of albuminoid ammonia, organic matter, and chlorine, and are unfit and highly dangerous for use. They are absolutely condemned for drinking purposes. As is shown in the report, C is more strongly polluted than D. The analysis of the sewer water, E, is characteristic of sewer waters, and shows where C and D could obtain their nitrogenous organic matters. The sewer water contained excremental matter in suspension. Samples A and B contained small quantities of nitrates, and C and D showed nitrates, and nitrates in quantity.

Yours respectfully,

W. D. CHURCH, P. C.

During the year there has been added to the library of the Board, fifty-two volumes of reports from State and municipal health boards. All these are interesting and instructive, and are exchanges. Not a dollar, since the organization of the State Board, has ever been invested for books or periodicals, for the library of the State Board of Health. There is a more general and deeper interest than ever before, in reference to the purity of the food and water-supply, the ventilation, heating, and sewerage systems, and proper sanitary conditions and surroundings of public institutions and private residences. These advances are attributable, mainly, to the labors of the State Board of Health, and the educational and valuable instruction received and made known by the State sanitary conventions. Never before was there so deep an interest felt, or such thorough measures taken, to render the public and private water-supplies pure and free from contamination. While the duties and labors of the county and State health boards have been increasing and widening, yet the people are in more active sympathy with the measures recommended, and are more willing to aid in enforcing and observing the necessary sanitary measures.

The fifth annual State Sanitary Convention, under the auspices of the State Board of Health, holds its first session this evening. While these conventions have been growing in importance and value, yet the interest shown by the citizens of Manhattan and the faculty and students of the State Agricultural College, give assurance of the success and usefulness of

the present convention; and we have every reason to believe that the exercises will not only be instructive, but that the papers will be of merit, and valuable educators. May the people throughout the State appreciate the labors thus rendered in their behalf, and use all means, measures and influence in their power, to circulate and impart such knowledge and information that it may confer untold blessings upon communities, families and individuals, so that the seed thus sown may germinate and bring forth abundant fruit, in rendering thousands of homes thrifty and comfortable, and free from disease, suffering and death.

Respectfully submitted.

J. W. REDDEN,

Secretary and Executive Officer.

TOPEKA, December 4, 1890.

SPECIAL REPORTS ON SMALL-POX AND OTHER CONTAGIOUS AND PESTILENTIAL DISEASES.

SMALL-POX IN TOPEKA, SHAWNEE COUNTY.

BY W. A. WILLIAMSON, M. D., COUNTY HEALTH OFFICER.

TOPEKA, KANSAS, June 3, 1890.

J. W. Redden, M. D., Secretary State Board of Health, Topeka, Kansas—
DEAR DOCTOR: Allow me to present to you a report of the case of small-pox occurring in Topeka April 7th. On that day Dr. Weeks, of Parkdale, reported to the City Board of Health a case of what he supposed to be small-pox. By the time the City Board of Health saw the case, the character of the disease was apparent. The patient was a woman of about 40 years of age. She had one good vaccine scar on the left arm. When seen, the disease had advanced to the pustular stage, and was of the discrete variety. The husband, at the time of our visit, was working at the Santa Fé shops. A messenger was at once sent for him, and preparation made for building a high board fence around the premises. This being done, a night and day guard was put on, and the small-pox card placed on the fence in a prominent place. There were three children in the family—one showing a good vaccine scar; another was reported as having been vaccinated seven times, without any result; while the remaining one had never been vaccinated. The husband had two good vaccine marks.

None of the family contracted the disease, although they were about the mother during the whole duration of the disease. The case was discharged from quarantine May 29th. No other case originated from this one. I was unable to trace the origin of this case. The woman was a frequenter of the Salvation Army rooms, and may have been exposed there.

TOPEKA, KANSAS, December 17, 1890.

J. W. Redden, M. D., Secretary State Board of Health, Topeka, Kansas—
DEAR DOCTOR: I have to report to you four cases of small-pox occurring in Topeka last November. The family, a poor one, named Weir, lived on Seventh street, near the Santa Fé shops, and had recently moved here from the Oklahoma country by wagon. They failed to give me any history of exposure; nor was it possible to trace any disease in the neighborhood. The family consisted of father, mother, and four children. None of the children had ever been vaccinated, and all developed the disease; the parents had been vaccinated ten or twelve years ago, and they escaped. The

usual quarantine was established—high board fence, night and day guards. Although a number of the friends of the family had been in the house before the cases came to the knowledge of the Board of Health, yet no new cases developed. Desquamation has progressed nicely, and the quarantine will be raised in a few days. All the children recovered.

REPORT OF A CASE OF GLANDERS IN MAN.

BY S. M. PRATT, M. D., COUNTY HEALTH OFFICER OF BROWN COUNTY.

HIAWATHA, KAS., July 9, 1890.

J. W. Redden, M. D., Secretary of the State Board of Health: As health officer of this county, on the 1st inst. I visited one Elmer Marsh, in the southwest part of the county, five miles west of Horton, who was supposed to have taken glanders from a horse which had the disease. I found the disease had been quite prevalent among horses in that vicinity. The State Veterinarian had visited the locality, pronounced it glanders, and the horses were killed.

The young man Marsh became inoculated by the horse blowing the nasal discharge upon his face where there was a small razor-cut. The lymphatics of the face and neck and some upon the scalp were involved, and he was a most disgusting sight. There seemed to be no constitutional disturbance, and the patient was able to care for himself.

The family of Hon. W. R. Honnell, where he was at work, have been already somewhat exposed, and as the only means in my reach to isolate the case I ordered a tent, in which have been placed everything necessary for his comfort, with orders to burn all soiled clothing, towels, etc., with proper precautions in the matter of dishes, feeding, etc. This seemed to be our only resource, and will, I believe, be effectual in preventing any spreading of the disease.

He had been under the care of Drs. Stivers and Campell, of Horton, who gladly relinquished the case to Dr. Tuttle, whose experience as a horse-doctor, and lack of scientific education, were supposed to peculiarly fit him for the care of such a case. I am not able to give any information in regard to treatment of the case. Will report any new developments.

REPORTS OF DELEGATES.

NATIONAL CONFERENCE OF STATE BOARDS OF HEALTH.

[Report by H. D. HILL, M. D., of Augusta, delegate from the Kansas State Board of Health to the National Conference of State Boards of Health.]

Mr. President, and Gentlemen: The meeting at Nashville, Tenn., of the State Boards of Health, was, socially, a very pleasant one; and I trust and believe the work accomplished during its sessions will in due time show good results. The meeting was not so large in numbers as I had anticipated. About fifty delegates were present, and represented, I think, twelve different States. However, what it lacked in numbers was supplied in enthusiasm; for I can truly say, that never before have I met a more noble band of untiring workers, giving years of thought and toil, without money, and without price; going among the despised and the lowly, without the sounding of trumpets, or their voice being heard in the streets; scattering heaven's best gift to man broadcast along the highway, in the subjugation of a hideous foe, which, without mercy or respect of persons, visits alike the palace, and the cottage, and cuts down our loved ones on the right hand and the left. Then I repeat, these are the ones who, without retention, forgetting self, meet the dread pestilence which walketh at noonday face to face, and with the weapons snatched from the feet of Hygeia's statue on Ægrinus Hill, drive these hideous monsters of disease from our midst, restoring and assuring health to the people.

Among some of the most noted present, were the great Rauch, of Illinois; Baker, of Michigan; Cocran, of Alabama; Plunkett, of Tennessee; McCormick, of Kentucky; Lee, of Pennsylvania; Salmon, of Louisiana; Probst, of Ohio; and our own Schenck, of Kansas.

Nine printed questions were submitted to the conference for consideration, and were taken up *seriatim*; each one receiving the attention its importance demanded.

I was particularly charmed with the manner in which the discussions were conducted in connection with the different questions. They were free from acrimony, and no seeming effort to create a sensation, or draw attention to self; but simply to arrive at correct conclusions, and how to secure the greatest amount of good to the greatest number of people. As the proceedings will be published in full, in due time, it would be presumption in me to give anything more than passing notice of them.

I was much interested in the discussion of the question as to the best means of a proper comprehension of the principles and practice of hygiene

among the people; and I think some of the suggestions worthy of careful thought. In olden times it took the power of Deity to feed the hungry multitude; has time made the task less difficult? We think not; and to-day, he who is able to satisfy the necessities of a hungry, clamoring and dying people, either on the broad prairies of the West or among the hills of the East, must, like him who stood by Galilee's shore, have divinity vested in humanity; as it was said by Mr. Rauch, "There is no royal road;" but when we do reach this desired plane, and answer back to the constant importuning of "give!" "give!" it will be by the way of pestilence, through the crucible of experience and the test of time.

I was forcibly impressed with the thought expressed by Dr. Lindsley, of Tennessee, upon this subject, which was to cultivate relations of amity between health boards, the people, and especially the press; and I certainly voice this sentiment, for no one can hope to be appreciated, or do anything for the people, who does not constantly keep in touching relations with, or render assistance to them. Therefore, encourage every effort made to act in harmony with, or render assistance in any way to the health boards, by friendly recognitions, distribution of short papers on sanitary subjects, warnings of danger, and the careful distribution of annual reports of health boards.

Questions three and four in the calendar were discussed in an able and thorough manner; their importance being chiefly, that they involve to some extent the constitutional questions of the rights of States, and their duty toward each other during the prevalence of great epidemics, and the wise application of the principle of laws regulating quarantine.

After a free discussion, the resolutions submitted were passed, with the substitution of a word in resolution first (see printed report). A very exhaustive and interesting paper was read by Dr. Lee, of Pennsylvania, on the question of leprosy in this country, and the duties of the General Government toward it. While the conference did not wholly agree as to his statement of facts, argument or conclusions, it fully impressed me with the belief that we were far too careless concerning the question; and that unless more is done than is at this time being done to drive out from among us the cases already here, and also use measures to prevent others from coming, then we will awake to the awful fact some day that we have upon us the most horrible and incurable disease known to man since the world began, with the power to eradicate it gone; so we say, the authorities should not temporize with it through mistaken sympathy, but follow Dr. Lee's advice and stamp it out, though it may take dungeons and fire, directed by the power of the Government, to accomplish it.

The proposition submitted by the State Board of Kansas, relative to the desirability and necessity of having uniformity of blanks for the reports of vital statistics, was decided in the affirmative; but it was thought to be impracticable at the present time.

Proposition nine, submitted by the State Board of Ohio, whether State boards of health have executive powers, developed a difference of opinion, and quite an animated discussion; Dr. Cochran, of Alabama, opposing it. However, all differences were harmonized and an agreement reached, when it was found that the difference was in a misconception of what the powers should be, and not by whom enforced; and I believe this was the only rational one. Admitting that power is dangerous, it is only so when wrongly directed, and there is always a balancing influence behind the throne to check undue or unwarranted use of it; and a law, however good or wholesome, must be either a nullity or its benefits in a great measure lost to those whom it is designed to bless, unless, *pari passu* with it, there is a power to carry into effect its benign intentions, in securing the greatest immunity from the ravages of disease and death, by reason of, and through the wise administration and use of the laws of health, to a public only partially informed upon the subject. Where can a sufficiency of power be more safely lodged, or the interest of the people be better subserved, than in the hands of the State Board of Health, with the proper safeguards thrown around it?

At the evening meeting Dr. J. N. McCormick, of Kentucky, was elected president, and Dr. C. O. Probst, of Ohio, was elected secretary.

At 9 A. M. on the 20th, Dr. Bryce, of Ontario, read a beautiful and instructive paper on the disposition and demolition of the forests of the world, and its direful effect upon human society, by reason of it affecting alike the life and the health of the people, as well as the commercial interests of the nations of the earth. Unfortunately, there was no time left to discuss the merits of the paper. However, a committee was appointed to prepare a report on the subject, and present it to the Congress of the United States, praying it to take the necessary steps to prevent further unnecessary devastation upon public lands within its jurisdiction; and further recommended the continuance of its inducements for tree-planting, for the partial reparation, at least, of the injury already done.

The Conference then adjourned.

Now, Mr. President and gentlemen, I beg your pardon for having so long occupied your time, and can offer only as my excuse the interest I have in sanitation, and the fond memories which linger around the associations and the proceedings of the sessions at Nashville.

[Report by W. L. SCHENCK, M. D., delegate from the Kansas State Board of Health, to the National Conference of State Boards of Health.]

Your delegates to the National Conference of State Boards of Health report a pleasant and profitable meeting. Upon the discussion of the first question, "The best methods of disseminating public health knowledge," Dr. Schenck suggested that while the special duty of each State board was to its State, we were all but parts of a great whole, and that sanitary science was of no recent growth; that we might learn much from the methods

and reports from other States, and requested that secretaries of State boards send their reports to other State boards. After considerable discussion, and the manifestation of some warmth by the delegates from Florida, Alabama, and Tennessee, the resolutions proposed by Kentucky were adopted, changing "epidemic" into "dangerous communicable disease."

The committee to whom was referred the subject of leprosy was divided in opinion. Dr. Lee, of Pennsylvania, with a majority of the committee, believed it contagious, and that it should be isolated; while Dr. Hoegh thought it was not contagious.

The question proposed by the State Board of Kansas was fully discussed, with the conclusion that while a uniform system of blanks was desirable, it was at present impracticable.

Under the discussion of the question from Ohio, a committee was appointed to formulate a plan for the creation and organization of local boards of health, with instructions to report at the next annual meeting. As the transactions of the association will be published complete, for which, in the name of the Kansas State Board, we contributed ten dollars, we forbear further report.

The spirit of State and preventive medicine seemed to pervade the meetings of the American Medical Association, and other medical organizations.

The admirable address of the president, Dr. E. M. Moon, of New York, was a sketch of legislation, especially national legislation, from the beginning until now, upon sanitary questions, including the work of the State boards and the Marine Hospital service, showing fully what had been done, and what remains undone, and urging the erection of a national department of sanitation, including the diseases of domestic animals.

The address on Practical Medicine, by the honored father of the American Medical Association, and ex-President of the International Congress, N. S. Davis, M. D., LL. D., dwelt quite exhaustively upon the action of alcoholics, and inferentially upon their relation to State medicine; while Dr. John B. Hamilton, surgeon general of the Marine Hospital Service, as president of the section on State Medicine, made an admirable address to his section, discussing, from a national standpoint, the legislation had and needed to prevent the transmission from one country to another, and from State to State, of infectious and contagious diseases.

The address on State Medicine, by Dr. Alfred L. Carroll, of New York, seemed rather a flippant treatment of a vital question. The chief injunction was, "Go slow." He deprecated giving power to State boards, because sanitary science was in its infancy, and because they might make mistakes. Sanitary science will always remain in its infancy if it is always kept in its swaddling clothes. Though the child may make some mistakes before it learns to walk and run, it should be encouraged to use its muscles while they are developing.

Kansas and the Kansas State Board of Health received the honor of the next address on State Medicine.

In an address before the Association of Medical Colleges, the distinguished sanitarian, Dr. Rauch, said, in speaking in favor of higher educational standards, as we advance in knowledge and morality, dogmatism and school differences disappear. In the Illinois State Board of Health, though various schools are represented, the differences have never been named. All have always worked together harmoniously and for the uplifting of the profession, and the enlargement of public health.

REPORTS OF SPECIAL COMMITTEES APPOINTED TO VISIT STATE CHARITABLE INSTITUTIONS.

The following are reports from the several committees appointed by the State Board of Health to visit various State charitable institutions:

BLIND ASYLUM.

J. W. Redden, M. D., Secretary State Board of Health, Topeka, Kansas — DEAR SIR: We have the honor, as your committee instructed to inspect the sanitary condition of the Blind Asylum, located at Kansas City, Kansas, to submit the following report.

The building is located upon a high elevation of ground. The surface drainage is perfect. Its yards are fairly well kept, and they are shaded by trees, principally of native growth. There is more shade than should be; although the inmates are blind, sunlight is one of the essential factors in the make-up of a perfect sanitary condition. We regret that the State has not done as much for the institution as nature has for the location. The asylum is a large brick building containing forty rooms and twenty dormitories. The ventilation is deficient, although there are ventilators in nearly all the rooms, some of which are very poorly placed. The hot-air register in some rooms, especially in the school-room, is next to the floor, within about a foot of which are seated the scholars. Directly opposite in the same room there is one small window, just to the rear of the teacher's desk, and when the register is opened the hot air rushes out against the pupils, and its only escape is the open window, forming a draft of alternating heat and cold, which is very detrimental to the health of the pupils. This room is both badly lighted and ventilated. Several of the dormitories are poorly ventilated; the only ventilation in some of the sleeping-rooms are low windows, where the cots are placed close to them. The third story is especially poorly lighted: the artificial light furnished is kerosene lamps, there being from thirty to forty in the building. The parlors, dining-room and halls were in fair sanitary condition. The four bath-rooms and vaults lacked the proper cleanliness, as did also the hospital.

The artificial sewerage is fairly good. The water-supply is derived from wells and cisterns; the well-water is supposed to be better than that furnished by the cistern, although your committee made no microscopical or chemical test to determine the matter; there was evidently some contamination of the cistern water.

The outside vaults, one for boys and one for girls, were dug several years ago, and we are sorry to state that their condition is filthy; they are menaces to both inmates and employes. As they are elevated slightly above the asylum building, the accumulations for years (having never been cleaned out) will sooner or later penetrate through the soil and poison the drinking-water, which, when it occurs, will be attended with disastrous consequences.

The means of heating are deficient. There is no way to communicate to the fireman the temperature of the different rooms, except by sending him word; each different room is dependent upon the idiosyncrasy of the individual who has charge of that room for the regulation of its temperature, there being no thermometer to register the degree of heat or cold; hence the temperature in the different rooms varies, and must in consequence vary greatly.

We found no fire-escapes on the building. The building and grounds, as regards cleanliness, were not in the sanitary condition that we had expected to find in a State institution. Whether this was due to lack of discipline on the part of those in charge or lack of sufficient help, we cannot answer; although there are supposed to be about seventeen employés.

The kitchens and cook-rooms seemed to be in good condition. The cook-room, especially, is very much smaller than it should be, and its facilities for ventilation may be said to be absent.

The food furnished to the inmates, so far as your committee could determine, was good in quality, and in quantity it was sufficient.

Your committee would respectfully make the following suggestions:

1. That fire-escapes should be put on the buildings. The stairways are both dark and narrow, and if some means is not provided for the escape of the inmates and employés in case of fire, when it shall come there will be a fearful loss of life.

2. The ventilation in some of the rooms should be improved, and the hot air registers should be so placed that they will not endanger the health of the inmates.

3. That there should be some system to regulate the temperature of the rooms, and that thermometers should be placed in each room, with direction to the employés to keep an even temperature, one conducive to both health and comfort.

4. That some of the sewer traps, which seem to be out of order, should be repaired, as foul air may be forced back into the building if they are allowed to remain as they are now.

5. That the outside vaults either be entirely dispensed with or filled up, or thoroughly cleaned once or twice a year.

6. That the superintendent of the institution be urged to improve the sanitary condition, by placing it in a state of cleanliness, both inside and out, and keeping it so.

And last, that the Health Board request the Legislature to furnish sufficient appropriations to remodel the building, and to place in it approved methods of heating, ventilation, fire-escapes, and to place privy vaults below the water-supply, so that the water may not be contaminated by them.

D. C. JONES, M. D.,
J. MILTON WELCH, M. D.,
R. A. WILLIAMS, M. D.

Committee.

November 7, 1890.

DEAF AND DUMB ASYLUM.

J. W. Redden, M. D., Secretary State Board of Health, Topeka, Kansas—DEAR SIR: Agreeable to your instructions, we inspected the Institution for the Deaf and Dumb, located at Olathe, Kansas, on the 25th, and have the honor to submit the following report.

The building is favorably located, being on one of the principal streets of the city, and not far from the public square, and stands on a rise of ground, sloping on three sides, and of sufficient altitude to secure a fine view of a large portion of the city. The building is constructed of brick, with stone trimmings, with pressed-brick front, and fronting toward the south; it is of modern architecture in style, and four stories in height, including the basement, and consists of a main building 68 by 115 feet, with an extension on the east and west sides 57 by 60 feet, terminating in a building at each end 45 by 73 feet, containing one hundred and thirteen rooms, including well-appointed offices. The system of sewerage is excellent, being conducted by a system of pipes running through the rooms of the building wherever needed, and

carried into a main pipe laid under the building and is carried a half-mile, emptying into a little stream, the mouth of the sewer being twenty-five or thirty feet below the basement of the building. The water for cleaning purposes is received through the Holly system from a reservoir, and is abundant in supply and pure in quality, thus affording abundant means for keeping all filth completely washed away. The vaults for the deposits of human excreta are, in some of the rooms, composed of porcelain basins, while in others they are of wood with zinc lining—all with ample facilities for continuous flushing. The urinals are provided with escape pipes for the effluvia arising from frequent use, and are all located inside the building.

The buildings are heated by the direct-radiation system, the heat being governed by four large boilers in the basement, and conducted by flues to all parts of the buildings, thus securing an equal and pleasant temperature at all times.

The facilities for lighting the rooms are not quite perfect, being especially deficient in one of the reception rooms on the first floor; and I do not think the recitation rooms on the north side of the hall on the second floor afford the proper amount of light during the day, as all the light received into the rooms thus situated is from the windows of the north side, which in the most of these rooms is deficient and falls from the wrong direction. However, I do not know at present if this condition of things can be prevented. At night the building is lighted by gas generated in one of the out-houses. The question of light in the education of deaf mutes is of absorbing interest, as everything taught them must be through the eyes, and not the ears.

The system of ventilation is good, with one exception; the flues for conducting the foul air from the lower rooms, terminate in open ends, in the garret. They should be finished, and should extend through the roof out into the open air, as this garret is large, and used for a gymnasium for the pupils; besides, under certain conditions, the foul air may be carried down the flues into the rooms again, which might cause serious trouble to the inmates, by inhaling it into the lungs.

Some of the sleeping-rooms of the boys are over-crowded; in one room containing thirty beds, only 45 square feet, or 596 cubic feet, was allowed each bed. In nine rooms the beds are thus crowded together, and there is no provision for isolation in event of any epidemic of an infectious disease. The facilities for hospital service are only fairly good. The chapel room is also too much crowded at present, and the numbers are increasing; there are 220 chairs crowded together in a space of 27 by 33 feet, with a 14-foot ceiling, and 20 of the attendants upon the service are compelled to stand in this room. It has to answer for a general auditorium for all literary exercises, and its frequent crowding cannot be but detrimental to the health of the innocent and helpless pupils.

The facilities for bathing are sufficient; two reservoirs, with a capacity of receiving twelve children at one time, easily supplied with pure water and readily cleansed, are a stationary fixture within the building. Play-rooms are connected with the recitation rooms, affording ample opportunities for exercise.

The drinking-water is supplied from wells, and seems to be pure and abundant.

The food supply is all that could be desired, the latest and best methods of preparing it, with a view to health and enjoyment, is maintained, and a good and necessary variety constantly furnished. I herewith attach the dietary list for one week, as a sample:

ONE WEEK'S BILL OF FARE AT THE KANSAS INSTITUTION FOR THE DEAF AND DUMB.

Tuesday—Breakfast: Beef-steak, bread, butter, syrup, coffee, milk. Dinner: Roast beef, baked sweet potatoes, gravy, bread, cottage pudding. Supper: Mush and milk, bread, butter and fruit.

Wednesday—Breakfast: Oat meal, beef-steak, bread, butter, syrup, coffee. Dinner: Meat stew with dumplings, potatoes, bread, butter, syrup, pie. Supper: Fried potatoes, baked apples, bread, syrup, butter.

Thursday—Breakfast: Oat meal, milk, beef-steak, bread, butter, syrup, coffee. Dinner: Roast beef, potatoes, turnips, bread, butter, pudding. Supper: Fried potatoes, bread, butter, syrup, milk.

Friday—Breakfast: Oat meal, milk, beef-steak, bread, butter, syrup, coffee. Dinner: Roast beef, boiled cabbage, bread, butter, syrup, rice. Supper: Graham mush, milk, beef-steak, bread, butter, coffee.

Saturday—Breakfast: Bread, butter, hash, coffee, syrup, oat meal, milk. Dinner: Meat stew with dumplings, potatoes, bread, butter, pudding. Supper: Fried potatoes, bread, butter, milk, fruit.

Sunday—Breakfast: Oat meal, milk, beef-steak, bread, butter, coffee. Dinner: Roast beef, baked sweet potatoes, bread, butter, syrup, pie. Supper: Bread, butter, syrup, milk, fruit, cake.

Monday—Breakfast: Oat meal, beef-steak, milk, bread, butter, syrup, coffee. Dinner: Meat stew with dumplings, potatoes, bread, butter, syrup, rice pudding. Supper: Bread, milk, fried potatoes, syrup, fruit.

Tuesday—Breakfast: Oat meal, milk, beef-steak, bread, butter, coffee.

The clothing is laundried by steam in an out-building, and in which the best system of purifying infected clothing may be accomplished with little extra trouble. The milk is obtained from a country dairy, and is presumed to be pure. I can and am glad to say that all the departments in the institution are under the best discipline, and the health of the pupils constantly kept in mind. Every pupil is compelled to bathe and a change of clothing of person and of bed exacted once every week; and the building, with one or two exceptions, is scrupulously neat and clean. I noticed two of the rooms were filled with impure air, which was explained to be caused by non-use; and also two of the privy vaults were not well cleansed, giving off foul odors; and I think the general privy for boys, in the basement, should have better facilities for cleansing, for while the foul odor does not come up into the room above, the smell is offensive while down in the vault, and would be very unfortunate if typhoid fever should suddenly manifest itself among the pupils. I do not attribute this condition of things to the superintendent, but to faulty construction.

I noticed that too many of the children seemed pale, and about twenty pupils have symptoms of opthalmic weakness. To what shall we attribute these conditions? They are well fed, well clothed, and have sufficient exercise, good beds, and plenty of sleep. May it not be that too much exercise taken within the building and the lack of ventilation of which I spoke contribute to this condition? They remind me too much of plants in the cellar—not enough light and sunshine, Nature's stimulants.

Taken as a whole, I think the institution is well managed, and is a credit to the great State of Kansas and to those who have charge of it. There are at this time, I believe, 239 pupils under charge, from 8 to 28 years of age, and to teach them to be self sustaining is worthy the ambition of the greatest.

I desire to express my sincere thanks to Prof. Walker for his courteous treatment and the facilities he so heartily afforded me for the inspection.

I remain, sir, your obedient servant,

H. D. HILL, M.D., *Committee.*

INSANE ASYLUM AND REFORM SCHOOL, AT TOPEKA.

Dr. J. W. Redden, Secretary of the State Board of Health — DEAR SIR: The committee appointed by the State Board of Health, in regular session, for sanitary inspection of the Insane Asylum and Reform School, institutions of the State of Kansas, located at Topeka, met on the 18th day of September, 1890, according to previous arrangements, at the office of Doctor D. C. Jones, one of the committee residing in the city of Topeka; and through his courtesy were furnished conveyance to and from the asylum. On our way to the asylum, on leaving Kansas avenue we drove out Sixth street, which we followed through a rich portion of the city directly west, for a distance of two and a half miles, to the western limit of the city. At this point

we crossed a small creek, which receives the surface drainage from a small portion of the city, and all the surface drainage in front of the asylum for a distance of a half mile from its site, and empties it in the river more than a mile below. From this creek our course lay northward along the main travel, which soon brought us to a beautiful blue and natural-grass sward, containing about thirty-five acres in nearly square form, artistically set in forest trees, ascending into a high ridge. On this ridge the asylum is erected.

We admire the wisdom shown in this selection; also that of the architects, in the adaptation of means to ends sought. The asylum is in two departments, about twelve rods apart. The first is an old-fashioned, square-formed two-story brick, used for the benefit of what are considered the incurable insane, superintended by the careful and skilled Doctor George L. Beers. As we did not inspect its inner structure, or its inmates, we passed to the new and more capacious three-story stone structure, builded on a zig-zag style, giving it an appearance of great strength and beauty. On entering the building we were cordially received by the Superintendent, Doctor Eastman, who upon being informed as to the object of our visit proceeded at once to conduct us through. Passing out of his elegant office into a long corridor furnished with comfortable seats on either side, about the first thing that attracted our attention was the perfect cleanliness of the ceiling, walls, seats and floors; the latter being heavily varnished and so smooth that one is minded to be careful how he moves, lest he lose his footing. All the rooms on the several floors are constructed on one general principle, and are lighted by electricity, heated when necessary by steam and ventilated by means of proper openings in the walls, through some of which a constant upward current of fresh air enters each apartment, through others having a strong downward pressure the poisonous gases escape. These currents are kept constant by large rotating fans in the basement, which are driven by an engine that runs the laundry, bakery, kitchen, and many other things too tedious to mention.

Every apartment of this building, except those mentioned, is heated, when necessary, by steam.

Dr. Eastman informed us that in order to keep the rooms in such perfect cleanliness, they had them carefully and thoroughly scrubbed with paraffine at least once each week, and on intervening days used rubbers, in which were kept wooden blocks about 18 inches long, and covered with heavy flannel, and supplied with handles of sufficient length for one to walk at leisure and push or pull them on the surface of the floors, thereby removing all dust. By this method, all the rooms are kept in perfect cleanliness, and that, too, without the use of water, except on very rare occasions.

The food-supply is abundant, and of good quality.

The sewerage is fair, and empties into the river something over a half-mile distant.

Arriving at the foot of the hill on which the asylum is erected, (about 80 rods distant, in a direction towards the river,) we reached a large, rich, level bottom farm belonging to the premises. On this farm, near the foot of a hill, is a large well dug, from which the water-supply is pumped by an engine near by. There are twenty-five drive wells at various points on the farm, which are auxiliaries to the water-supply.

The information given by the Superintendent on all points of interest showed that he was conversant with the principles of sanitation. He informed us that he was overcrowded in his department, having 750 consigned to his charge, which is about fifty more than ought to be there. Also, that there are at least 150 others in our jails, for want of room in the asylum. We suggest, therefore, that there be

caused to be built a wing on the west of the stone building, of sufficient size to exceed the present demand; also, the offices to be moved from the rear wing as now situated, to suitable rooms in the front portion of the main building; and further, that in the near future there be an insane asylum erected at some other convenient point in this State.

REFORM SCHOOL.

There are 215 pupils in the Reform School, most of whom were on drill at the fair ground. Their ages range from seven to twenty-one years; average age about fourteen years. Those on drill were dressed in neat uniform, and exhibited good personal cleanliness. They showed that they had been well cared for, both as to healthy food and proper hygiene; also, under good control. The Superintendent was courteous, and rendered the committee valuable assistance. The ventilation, heating and sewerage could be greatly improved.

Respectfully yours,

November 6, 1890.

D. C. JONES, M. D.,

R. C. MUSGRAVE, M. D.,

FRANK SWALLOW, M. D.,

Committee.

MISCELLANEOUS PAPERS.

THE INFLUENCE OF HABIT ON THE BODY.

Following are remarks of W. L. Schenck, M. D., member of the State Board of Health, at chapel exercise of the Agricultural College, during the meeting of the State Sanitary Convention:

Mr. President, and Members of the State Agricultural College: I am glad of an opportunity to talk to so many of you this morning. The strong and liberal-minded apostle to the Gentiles said: "I delight in the law of God after the inward man. But I see another law in my members, warring against the law of my mind, and bringing me into captivity to the law of sin, which is in my members. O, wretched man that I am! who shall deliver me from the body of this death?"

Through all ages stalwart men, men with forces that give strength and character to life, have uttered the same pathetic cry. With them life has been a battle, but conquering they have moved the world. Let the winds blow and the wild waves lash the ship, if he who holds the helm keep a clear eye and a steady hand they but speed him on his way. To him "life is earnest, life is real," whilst to the man without emotions, without passions, it is

"Idle as a painted ship
Upon a painted ocean."

Carnal appetites and desires are not evil. They are the gifts of an all-wise Creator. Temptations are ever-present sources of strength.

The development and strength of every organ of the body, every function of the mind, every attribute of the soul, comes through use. It is power born of resistance. Strength springs from action. Action, physical or spiritual, continually wears away the old atoms of the body, and replaces them with new, thus keeping every brick and beam in this house in which we live new and strong and beautiful, and the greater the activity, within reasonable bounds, the stronger the home. It is a mistake to suppose the spirit is good and the body evil, that it is to be crucified in the interest of a higher self. He who made both pronounced both very good. There is no antagonism, only coöperation through action. The cry for deliverance only comes when a strong soul is tossed by the waves of passion. If true to itself, deliverance is at hand, and it comes forth more than conqueror—"tempted in all things, yet without sin," strengthened through conflict. In this life, the spirit gathers, correlates, and manifests knowledge and power through the instrumentality of the body, and while the soul may deplore association with an unbridled animalism, its character depends on the health and strength of the body, for which it is largely responsible. "*Mens sana in corpore sano.*"

The soul can rise no higher than the possibilities of the instrument through which it works, but its power to mould the instrument to its use is equal to its possibilities.

Not even an agricultural college can teach you how to prevent, without proper culture, good Kansas soil from growing cockle-burs and sunflowers, or how you can gather wheat from cockle-burs or corn from sunflowers; but it can teach you how to keep them down, and how to garner grain from such soil, as well as how to prepare soil that will grow either or neither. Soul- and body-culture are as amenable to law as field-culture, and with both, the crop will be what you make it.

The text assigned to me for a moment's talk is, *The Influence of Habit on the Body*. Habit, from *habitare*, translated by Webster, "to have frequently," we would define, in applying it to the text, as that regular and methodical use of body, mind, or soul that keeps them in certain lines until their development makes action in those lines automatic. All habits are developed through the consent or direction of the intellectual and moral man, unless they have yielded supremacy to carnal appetites and passions. While carnal appetites and desires may war against that which is spiritual, the spirit is not only endowed with power to keep them within due bounds, but to develop, educate and wield them in the interest of both the mortal and immortal man. Through its connection with the body, as it controls or is controlled, the soul becomes angel or beast.

Out of a single embryonic cell has been differentiated and proliferated all the varied types of cells that constitute the adult body. Though they differ widely in form and function, there exists among them no farmers' party, no party of employers and employés—no east, no west, no north, no south. While each cell is endowed with an individual life, and performs a specific work, they form one grand commonwealth—a perfect unit—each working for all and all for each, but with a discerning and directing power inherent in the nervous tissues; and in this tissue there sits enthroned a soul, which, while it receives through it its power to act, stamps upon it, and through it upon the whole organism, its own individuality, and by an immutable law it is forced to stand by its record; to use the machinery it has moulded, to garner what it has sown. All the tissues, organs and functions of the body are largely controlled by intelligent, habitual use. By the habitual and intelligent use of the sense of touch the blind man sees through his finger-ends and the typographer reads the finest type. By long practice and fixed habit the musician converts the tongues and strings of his instruments into songsters, and attunes his vocal chords to heavenly music. By oft-repeated effort the artist transfers to his canvas all that is beautiful in nature. By repeatedly meeting and resisting forces the athlete develops his herculean strength. By habitual use in harmony with fixed purposes we make the body the willing servant of the mind, controlling not only its passions and appetites, but developing it to its purpose, making even its glands secrete and excrete by force of habit.

Faith stimulates, hope energizes and charity sustains the activity of the cells through which they act, and vitalize the whole body. Under their stimulus muscles move, organs act, tissues develop, and the thrill of health pervades the body; "long life and peace" are their reward.

Other emotions of the soul, oft repeated, produce equally marked impressions upon the body. Fear pales the cheek, contracts the capillaries of the surface, makes its victim shiver like the breath of Boreas, and the dry mouth of the coward refuses utterance. The self-important, haughty soul stamps all there is of it on a very small muscle with a very long name—*levator anguli oris et aliqua nasi*. The sullen soul corrugates the brows, and makes a half-moon of the mouth, with the horns turned down. So each passion and emotion, by habitual use, writes its character on the movement and development of the various muscles of the body. You may remember the story of the artist who painted the likeness of a child of angelic beauty, and for years sought a face from which to paint its antitype as a companion-piece; and when at last his devil was found and his portrait placed beside his angel, the resemblance was so singular that he sought again the original, and found it was his baby face made hideous through the habitual indulgence of sinful lusts and appetites.

Habit not only makes natural appetites and desires, ministers of health and happiness, or of disease and misery, but educates the senses until things that are natur-

ally distasteful and injurious are pleasant. Desire, appetite and passion are implanted in man for pure and holy purposes, but the indulgence of impure thoughts beget vice. A filthy imagination tends to adultery. The habitual debasement of the pure and holy temples of nature end in misery, disease and death, and the infliction of these penalties does not end with the lives of those who sin, but taints the whole line of their posterity. While correct habits are of vital import, they do not come without effort. They cannot be acquired in a day. To reign triumphant they must commence with life. Children are creatures of imitation. The infant, "mewling and puking in its mother's arms," through sympathy contracts or arches its brows, turns up or down the angles of its mouth, coos with the soft, sweet voice of love, or with the cracked-metal tones of the virago, and through reflex the soul responds to the impressions made upon its muscles and senses. "Train up a child in the way it should go, and when it is old it will not depart from it"; and the converse is equally true. Wisdom, as well as knowledge, must be implanted in youth. Habits, once formed, rule our lives for weal or woe. They develop a will-force that overcomes all obstacles to the harmonious and natural growth of all that purifies and refines, uplifts and enobles, or they overcome conscience and will, and make carnal appetites and lusts—gluttony, drunkenness, licentiousness—supreme. The pusillanimous soul, yielding again and again, the power nature created to command is ruthlessly thrust aside and trampled under foot by another self, born to be its helpmeet and servant.

The strong and noble soul, ruled by morality and intelligence, keeping within due bounds all the forces of the body in which it dwells, and moulding them to minister to its aspirations, makes man physically, intellectually and morally a beautiful, strong, and harmonious whole.

Read and heed the wisdom of the wise: "Remember now thy Creator in the days of thy youth, while the evil days come not nor thy years draw nigh, and thou shalt say, I have no pleasure in them."

Habitually disregard His laws and you will blot out the image of Him in whose likeness you were created; a gross sensualism will rule your life, and with sadness of soul you will exclaim, "I have no pleasure in it."

Habitually, conscientiously obey the laws of Him who created you for grand and noble purposes, and endowed you with power to control every organ and function of the body, every attribute of mind and soul to the glory of God, and the uplifting of humanity, and day by day you will grow into His image.

PRACTICAL MEASURES FOR CONTROLLING THE SPREAD OF INFECTIOUS DISEASES.

The following address, read before the Kansas City Academy of Medicine, at a recent session, by E. S. Middlebrook, M. D., Kansas City, Mo., is worthy of careful investigation and thoughtful study, because it is brimful of practical suggestions and useful information:

Two centuries ago the mortality of London was eighty per one thousand; now it is twenty-three. A century ago ships could hardly sail the seas because of scurvy; now scurvy is almost unknown. Not many years since jails and hospitals were hot-beds of dangerous and infectious diseases; now these are absolutely free from danger. Why this change? Because the sanitarian, by study of pathology and etiology, has been able to arrest the spread of infectious diseases by means readily used.

Hence, the necessity for recognition of the *first case* of a contagious disease is apparent, and the danger of non-report to the authorities is appreciable to all. But, strange to say, even in this enlightened age there are some physicians who do not appear to realize the importance of reporting infectious diseases to the health department, and often the first information we have of the existence of a dread malady is the appearance of the undertaker with a death certificate reading "diphtheria," "scarlet fever," or "small-pox," written as the cause of death. Is this right? Is this professional? Is it coöperating with the Board of Health "to stamp out disease and carry out the noblest object of the physician—prophylaxis"? As a department of the city government, the health department is almost powerless if compelled to work alone; in the suppression of disease not only should neighbors act with neighbors, towns with towns and states with states, but physicians should assist the health officer. Besides, doctors ought, as far as possible, to aid in enlightening the people in sanitary matters. If this could be universally done, it would accomplish more than any Edward Bellamy in abolishing epidemics, paupers' bills, hospitals, asylums and jails.

CHECKING THE SPREAD OF DISEASE.

It is now generally acknowledged that when a disease has been imported from a neighboring town (and excluding the possibility that it is endemic in the locality where the outbreak occurred), its spread may be arrested by quarantine, correcting unsanitary surroundings, etc. Therefore, where a physician is called to a case of possible contagious kind, and yet is not certain of his diagnosis—at least sufficiently so to report the case to the board of health—he should inform the family of the possibility of its spreading, and immediately isolate the patient and temporarily quarantine the sick-room. No doctor will lose the respect of any family by this exhibition of care. He ought to see that the sick-room is well ventilated, without cold draughts, completely cleared of all needless draperies, carpets, and furniture, and possibly hang sheets wet with some disinfectant, as sulphate of zinc, at the door communicating with the other part of the house. As soon as the diagnosis is confirmed, the disease should be reported to the clerk of the board of health, that the house may be placarded. And no pleadings on the part of wealthy and influential patrons should prevent an honest physician from making his report and seeing that the danger signals are placed in a conspicuous place.

No one save the doctor, the nurse and the nearest relative should be allowed to enter the sick-chamber until after all danger of carrying contagium is passed. The physician should, if possible, change his clothing and carefully wash his hands and whiskers on leaving the room, as some disease germs are very easily carried. The nurse should have a dress made of material called "wash goods," rather than of wool, which readily harbors germs of all kinds.

CARE OF THE SICK-ROOM.

Soft cotton rags should be used for wiping the nose and mouth, and after once using should be immediately burned. A disinfecting solution should always be put into the cuspidor for the patient to spit into; and all discharges from the body should be received into vessels having the same disinfecting fluid, and quickly emptied into the water closet, not being allowed to stand around the house, as is so often done. Clothing of the patient, bed-clothing, etc., should, when changed, be thrown into a disinfecting solution, as

| | |
|---|---------------------|
| Bichloride of mercury, | |
| Permanganate of potassium, of each..... | dr. ij |
| Soft water..... | 1 gallon. Mix. |

They should remain in this solution at least two hours, then taken out and boiled. The washing should not be allowed to be sent away from the house.

SANITARY SURROUNDINGS.

The family doctor ought to look after the welfare of his patrons. He should examine the plumbing, the sinks, drains, privies, and cess-pools, seeing that no foul odors can escape; if the pipes leak, they must be repaired; if the privies or cess-pools are foul, they should be thoroughly disinfected with

| | | |
|--------------------------|------------------|------|
| Sulphate of copper..... | lb $\frac{1}{2}$ | |
| Corrosive sublimate..... | oz. 1 | |
| Water..... | gal. 1 | Mix. |

One part of this solution to four of the contents of the vault may be used, care being taken to wet all sides and exposed parts of the wood-work of the vault, after which the contents should be removed. The same solution may be used for sinks, drains, etc.

Great care should be taken that the water used for drinking is of a proper kind, and pure. If there should be doubt as to its being wholesome, it should be boiled before using. Milk, also, should be inspected, especially in summer, as it readily absorbs germs of all kinds; it should be kept covered, and entirely away from the patient's room.

MANAGEMENT AFTER RECOVERY.

The patient should remain in complete isolation until entirely well, and ought to be under supervision of the doctor until all danger of communicating the disease is past. These precautions should be used in *all* cases, as the danger of infection is the same in mild as in virulent attacks.

After recovery, all clothing and bed-clothes must be carefully disinfected by being placed in sublimate solution, and afterward in boiling water. If the subject die, the body should be wrapped in a sheet saturated in a strong sublimate solution and buried as soon as possible; the funeral should be private, and no one allowed to "view the body."

If the disease be one of special virulence, the house should be fumigated—not simply by burning a little sulphur in the room, but by a competent person, all bed-clothes, woolens, etc., being strung on clothes-lines in the room. The mattress should be burned. After having the cracks of the windows and doors carefully stopped—every place where the fumes can escape being attended to—a common wash-tub should be placed in the middle of the room with about three inches of water in it; in this a kettle of iron is to be placed, containing for every 1,000 cubic feet in the room three pounds of sulphur; a little alcohol is to be poured on the sulphur, a match touched to it and a rapid exit made. The room must remain tightly closed for twenty-four hours or more, and then the room and contents "aired" for several days.

The effectiveness of disinfection is well shown by this extract from the report of the Iowa State Board of Health:

"In the fall and early winter, there were at several points in the State an unusual number of cases of diphtheria, with a considerable mortality. In all cases, however, where the disease assumed anything of epidemic proportions, this result was easily traceable to palpable and criminal neglect of the plainest rules of quarantine and disinfection; on the other hand, where prompt and efficient quarantine and isolation were established, outbreaks of the disease, though in a most malignant form, were limited to one or two families."

FINANCIAL AND PROPERTY STATEMENT.

EXPENDITURES OF THE STATE BOARD OF HEALTH,

FOR THE FISCAL YEAR ENDING JUNE 30, 1890.

The appropriation for said fiscal year for the expenses of the State Board of Health and the Secretary, including the salary of the Secretary, was \$3,500. Classified statements of the expenditures of the Board during said fiscal year are as follows:

| | |
|---|------------|
| Expenses of members attending meetings of the Board, sanitary conventions, and State charitable institutions..... | \$300 00 |
| Office rent..... | 210 00 |
| Postage..... | 85 00 |
| Janitor for office..... | 60 00 |
| Express charges..... | 205 45 |
| Gas..... | 6 80 |
| Telegrams..... | 1 00 |
| Record book, paper and ribbons for typewriter..... | 28 00 |
| Expenses of members and committees visiting small-pox epidemics, and assisting in quarantine, and attending the American Public Health Association, International Conference of Hygiene, and National Conferences of the State Board of Health..... | 503 00 |
| Dr. Reid Alexander for chemical and microscopical examinations..... | 45 00 |
| Secretary's salary..... | 2,000 00 |
| Balance unexpended in the hands of the State Treasurer | 55 40 |
| Total..... | \$3,500 00 |

LIST OF PROPERTY BELONGING TO OFFICE OF SECRETARY STATE
BOARD OF HEALTH, DECEMBER 31, 1890.

| | |
|--|--|
| 1 letter press. | 1 paper weight. |
| 1 letter copying book. | 1 craser. |
| 1 letter-press stand. | 1 water bowl and brush (for press copying). |
| 1 pair small scales (for postal matter). | 1 soap dish. |
| 1 waste basket. | 1 looking-glass. |
| 1 gas drop light. | 2 glass tumblers. |
| 1 ink stand. | 1 slop bucket. |
| 2 letter filing cases. | 1 door scraper. |
| 4 record books, "A," "B," "C," and "D." | Am. Monocentennial stand, with 5 eye-piece, mechanical Stagn. and case (microscope.) |
| 1 journal book, "A." | Abbe condenser. |
| 1 cash and property book. | 1½ objective. |
| 1 scrap book. | ⅞ objective. |
| 4 cuspidores. | ½ objective. |
| 1 wash stand. | ¼ objective. |
| 1 wash bowl and pitcher. | ⅛ objective. |
| 1 door mat. | Double nose-piece. |
| 1 upright walnut book case. | Camera trucid. |
| 1 soft-coal base-burner. | Stagn. micrometer. |
| 1 hatchet. | Eye-piece micrometer. |
| 1 shovel. | Animalcule cage. |
| 2 coal buckets. | Blue and ground glass. |
| 1 upright desk. | Bulls-eye condenser. |
| 1 small revolving book case. | Side reflector. |
| 1 Brussels carpet. | 1 analytical bal. No. 7, Becker's. |
| 1 paper cutter. | |

- 1 Mohr's burette w. gl. stopc.
 1 Mohr's burette w. pincher cock.
 1 Mohr's wood burette supp. for 2 burettes.
 1 8-oz. retort, Boh. tub and stopp.
 1 16-oz. retort, Boh. tub and stopp.
 1 32-oz. retort, Boh. tub and stopp.
 2½-gal. retort, Boh. tub and stopp.
 1 Liebig's cond., 30 on metal stand.
 1 Liebig's cond., imp. 15. No. 4310.
 10 Nessler's cylinders.
 1 each large, med. and small sp. clamps, nickel pl.
 1 iron 4-ring stand.
 1 iron 3-ring stand.
 1 pt. litre bottle. 1 litre gl. st.
 1 pt. litre bottle. ½ litre gl. st.
 1 pt. litre bottle. ¼ litre gl. st.
 1 pt. litre bottle, 100 cc.
 1 pt. litre bottle, 50 cc.
 1 pt. litre bottle, 25 cc.
 1 pt. wash bottle flask sb.
 1 Bunsen burner.
 1 Bunsen burner, w. stop-cock.
 1 Bunsen burner, w. tripod and chimney-net.
 2 con. parting flasks without ring, 6 oz.
 1 quire Swed. filter paper.
 1 ea. 4, 8 and 16 oz. f. b. Boh. flask.
 6 No. 4 R. B. parcel evap. dishes.
 1 No. 9 evap.
 2 pill tiles, grad., 6x6.
 2 grad. pipettes 10 cc. ⅓
 2 ea. 2.30 and 5.40 cc. vol. pipettes.
 1½ gall. copper dist. app. compl.
 1 nest pl. Boh. beakers, ⅓.
 1 nest Griffin beakers, ⅓.
 1 set wts. of precis., Beck 500.00183 riders.
 2 doz. asst. Am. I. R. stoppers, 1, 2, 3, 4, incl., net.
 2 ea. 8, 7, 6, 5, 4, 3, 2, hole fr. I. R. stoppers.
 1 Fletcher's solid flame burner, net.
 12 ft. ½ wh. I. R. tubing comeq. net. 10.
 12 ft. ⅓ wh. I. R. tubing comeq. net. 9.
 2 Boh. adapters.
 1-8 Boh. funnel.
 1 ea. 1½, 2½, 3½, 4½, 5½ and 6 Boh. funnels.
 1 tripod, 7 high w. 3 rings.
 1 tripod, sheet iron, 5 rings.
 ½ square ft. brass wire gauze, 2 pieces.
 6 pipe clay triangles.
 1-8 copper water bath.
 1 lb asst. glass rods.
 1 pr. nickel pl. cine tongs, double.
 1 Erlemeyer T. T. stand.
 2 doz. 6 in. T. tubes.
 2 T. T. brushes, sp. end.
 1 wood T. T. clamp.
 3 lbs potass. permang. c. p.
 3 lbs hydrate stick.
 1 oz. nitrate silver.
 1 oz. potass. chromate, c. p.
 1 lb. bar. chloride, c. p.
 1 lb. abs. p. oconc. Hcl.
 1 lb. abs. p. oconc. H. No. 3.
 1 lb. abs. p. oconc. No. 2,004
 ½ lb. potass. iodide, c. p.
 1 oz. mercuric chloride, c. p.
 3 lbs. white castile soap.
 1 oz potass. ferriey, c. p.
 1 oz. potass. sulphocy, c. p.
 1 lb. iron sulphide, fused pure.
 1 lb. iron proto. sulphate, c. p.
 100 phenolphthaleine.
 1 oz. asst. germ. glass tubing, ⅓-⅓.
 1 platin. evap. dish. 11.5, 42.
 1 platin. evap. dish. 15.9, 10.66.
 1 platin. evap. dish. 25.4, 42.
 1 platin. evap. dish. 36.4, 42.
 1 platin. crucible and cover. 31.6, 42.

MISCELLANEOUS.

- | | |
|---|---|
| 8 letter files. | 180 books of return certificates of deaths. |
| 4 letter books. | 350 " " " marriages. |
| 52 first annual reports, paper. | 500 books of return certificates of undertakers' |
| 23 second " " " | burial-case permits. |
| 2 third " " " | 100 books of return certificates of still-births. |
| 45 fourth " " paper. | 1,760 " " " vaccination. |
| 86 fourth " " muslin. | 5,000 pamphlets on prevention of small-pox. |
| 76 fifth " " " | 600 " " " scarlet fever. |
| 76 fifth " " paper. | 1,000 " " " diphtheria. |
| 300 books of return certificates of births. | 1,500 " " " typhoid fever. |

LIST OF BOOKS AND PUBLICATIONS RECEIVED,

AND PLACED IN THE BOOK CASE OF THE BOARD, DURING THE YEARS 1835, 1836, 1887, 1888, 1889 AND 1890.

- 4 volumes of National Board of Health Reports.
 2 volumes of Reports of Health Officer of District of Columbia.
 3 volumes of Reports of Board of Health of Ontario, Canada.
 7 volumes of Reports of Wisconsin State Board of Health.
 2 volumes of Reports of Connecticut State Board of Health.
 4 volumes of Reports of Massachusetts State Board of Health.
 11 volumes of Reports of Michigan State Board of Health.
 3 volumes of Reports of Iowa State Board of Health.
 5 volumes of Reports of Illinois State Board of Health.

- 2 volumes of Reports of Indiana State Board of Health.
- 2 volumes of Reports of California State Board of Health.
- 4 volumes of Reports of New Hampshire State Board of Health.
- 1 volume Vaccination Report of New Hampshire State Board of Health.
- 2 volumes of Reports of Tennessee State Board of Health.
- 1 volume of Report of West Virginia State Board of Health.
- 1 volume of Report of Minnesota State Board of Health.
- 1 volume of Report of Louisiana State Board of Health.
- 3 volumes of Reports of Kentucky State Board of Health.
- 3 volumes of Reports of Mississippi State Board of Health.
- 1 volume Laws of Kansas, 1885.
- 2 volumes Report of the Surgeon General of the Navy—vol. 6, 1880, and vol. 7, 1881.
- 2 volumes Report of the Secretary of the Navy—vol. 1, 1883, and vol. 2, 1884.
- 1 volume Sanitary and Statistical Report of the Surgeon General of the Navy. 1879.
- 1 volume Hygienic and Medical Reports, 1879—vol. 4, Navy Department Bureau of Medicine and Surgery.
- 1 volume Report of Surgeon General of the Navy. 1884.
- 1 volume Report of the State Board of Health, Michigan. 1884.
- 1 volume Seventh Annual Report Illinois State Board of Health.
- 1 volume Report Wisconsin State Board of Health.
- 1 volume Ninth Annual Report of New Jersey Board of Health.
- 1 volume First Biennial Report of the State Board of Corrections and Charities, Minnesota.
- 1 volume, first volume complete, of Public Health in Minnesota.
- 1 volume Official Register of Physicians and Midwives, Illinois. 1886.
- 1 volume Annual Report of the Board of Health of Fall River, Massachusetts. 1885.
- 1 volume First Annual Report State Board of Health of the City of Newark.
- 1 volume Charter and Ordinances Board of Health, City of Buffalo, New York.
- 4 volumes of the Annual Reports of the State Board of Health of New York—first, second, third, and fourth.
- 1 volume of the Nineteenth Annual Report of the Board of Health of Cincinnati, Ohio.
- 1 pamphlet of Public Health in Minnesota.
- 1 pamphlet on the original Jennerian Vaccine Virus, as preserved and used in public vaccinations in the city of Providence, Rhode Island.
- 1 volume Report on Registration, presented to the Quarantine and Sanitary Convention, at its fourth annual meeting, held in the city of Boston, June 4, 1860.
- 1 pamphlet on Small-Pox in the City of Providence, from January to June, 1859.
- 1 volume of Third Annual Report of the Superintendent of Health of the City of Providence, for the year ending December 31, 1885.
- 1 volume Annual Report of the Health Department of the City of Baltimore. 1885.
- 1 volume Report of the Health Officer of the District of Columbia. 1885.
- 1 volume Report of the National Board of Health. 1885.
- 1 volume Laws of Kansas. 1886.
- 1 volume First Annual Report of the State Board of Health of the State of Maine.
- 1 Report of the Third Annual Meeting of the Ohio State Sanitary Association.
- 1 pamphlet Registration Report of New Hampshire. 1884.
- 1 volume Vital Statistics of Indiana. 1885.
- 9 volumes Report of the New York City Board of Health. 1865, 1866, 1867, 1868, 1869, 1870, 1871, 1872, 1873.
- 1 volume State Board of Health Bulletin of Nashville, Tennessee.
- 1 volume of the Reports of President and Secretary of the Board of Health, Wilmington, Delaware.
- 1 volume Laws of Maryland, relating to the public health.
- 1 volume State Board of Health Report of New Hampshire. 1886.
- 1 pamphlet, The Sanitary Era, New York, (weekly.)
- 1 pamphlet Public Health in Minnesota, (monthly.)
- 1 pamphlet Constitution and By-Laws, and List of Members of American Public Health Association. 1886.
- 1 pamphlet State Board of Health of California, (monthly.)
- 1 pamphlet Statement of Mortality City of New Orleans, (weekly.)
- 1 pamphlet Returns of Deaths and Burials in Baltimore, Maryland, (weekly.)
- 1 pamphlet Report of Deaths of Providence, Rhode Island, (monthly.)
- 1 volume of the Eighth Annual Report of Rhode Island State Board of Health. 1885.
- 1 volume of the Fourteenth Annual Report of the Board of Directors of the Chicago Public Library, June, 1886.
- 1 volume Statement of Mortality of Buffalo, N. Y., (weekly.)

- 1 pamphlet of the Seventeenth Registration Reports of Vital Statistics, March, 1883.
- 1 volume of the Seventh Annual Report of the State Board of Health, Lunacy and Charity supplement. 1885-6.
- 1 volume State Board of Health, Michigan, 1885.
- 1 volume Seventh Annual Report of the State Board of Health of Rhode Island. 1884.
- 1 volume of the Eighth Annual Report of the State Board of Health of Rhode Island. 1885.
- 1 pamphlet of the Laws of the State of Kentucky relating to the public health and sanitary memoranda.
- 2 volumes of State Board of Health of Rhode Island. 1882-3.
- 1 pamphlet Proceedings and Addresses of the Sanitary Convention held at Kalamazoo, Michigan, June 1 and 2, 1886.
- 1 pamphlet Manual for Health Officers of Rhode Island,
pamphlet Nomenclature of Causes of Death.
- 18 volumes State Board of Health of Michigan, 1868, 1869, 1870, 1871, 1872, 1873, 1874, 1875, 1876, 1877, 1878, 1879, 1880, 1881, 1882, 1883, (vital statistics included.)
- Seventh Annual Report, South Carolina State Board of Health. 1886.
- Rules for Checking Contagious and Infectious Diseases. Toronto, Canada. 1886.
- Address by Dr. Holt on "In Shipping all Industries Unite." 1886.
- 1 volume Biennial Report of West Virginia, for years 1885 and 1886.
- 1 volume Tenth Annual Report of the New Jersey State Board of Health. 1886.
- 1 volume Biennial Report of the North Carolina State Board of Health. 1885 and 1886.
- 1 volume Eleventh Report of the State Board of Health of Minnesota (Biennial). 1884-1886.
- Proceedings of National Conference of State Boards of Health, at Toronto, Canada. 1886.
- 1 volume Eleventh Report (Third Biennial) of the Minnesota State Board of Health. 1884-1886.
- 1 volume Annual Report (Health) of the city of Baltimore. 1886.
- 1 volume First Biennial Report of the North Carolina State Board of Health. 1886.
- 1 volume Second Annual Report of the South Carolina State Board of Health. 1881.
- Third Annual Report of the South Carolina State Board of Health. 1882.
- Fourth Annual Report of the South Carolina State Board of Health. 1883.
- Seventh Annual Report of the South Carolina State Board of Health. 1886.
- Duties of Selectmen in regard to the Preservation of the Public Health. Rutland, Vermont, 1886.
- 1 volume Ninth Annual Report of the Board of Health of Fall River, Massachusetts. 1886.
- Proceedings of Sanitary Convention at Coldwater, Michigan, September, 1886.
- Proceedings of Sanitary Convention at Big Rapids, Michigan, September, 1886.
- Forty-fourth Registration Report of Massachusetts. 1885.
- 1 volume Ninth Annual Report of Connecticut State Board of Health, 1886, with the Registration Report for 1885.
- 1 volume Annual Report, H. O., District of Columbia. 1886.
- 6 volumes Report of Chief of Signal Service, Washington, D. C. 1879, 1880, 1881, 1884. Part 1, 1885, and part 2, 1885.
- 1 volume Third Annual Report of Superintendent of Health, city of Providence, R. I. 1885.
- On Bacteria in Ice. Dr. Prudens, N. Y. 1887.
- 1 volume Fifth Annual Report of Provincial Board of Health of Ontario.
- 1 volume Second Annual Report of the Board of Health of Newark, N. J. 1886.
- Laws relating to Public Health and reference thereto. New Jersey State Board of Health. 1887.
- 1 volume Report of Massachusetts State Board of Health. 1886.
- 1 volume Report of Ohio State Board of Health, First Annual. 1886.
- 1 volume Report of Maine State Board of Health, Second Annual. 1886.
- Report of Sanitary Convention at Modstick, Ontario, May, 1887.
- Laws of Kansas. 1887.
- Pamphlet of Lectures and Addresses at Farmers' Institute in Ohio. 1886. Sanitary.
- Annual Report of Department of Health, Buffalo, N. Y. 1886.
- Manual of Ohio Health Laws. 1887.
- Sixth Annual Report of the New Hampshire State Board of Health. 1886, 1887.
- Constitution, By-Laws and Regulations of the Pennsylvania State Board of Health. 1887.
- 1 volume Eighth Annual Report of South Carolina State Board of Health. 1887.
- 1 volume Annual Report of Health Department of the City of Baltimore, Maryland. 1887.
- 1 volume Sixth Annual Registration Report of New Hampshire. 1885.
- 1 volume Eleventh Annual Report of Wisconsin State Board of Health. 1887.
- 1 pamphlet Report on Sanitary Inspection of Passenger Coaches. 1887.
- 1 pamphlet Dangers in Gasoline. By John H. Kellogg, M. D., Battle Creek, Michigan.
- 1 volume Report of State Board of Health of Massachusetts, on Water Supply and Sewerage. 1888.
- 1 volume Laws of Pennsylvania. 1881.
- 1 volume Thirtieth Report of Vital Statistics of Vermont. 1886.
- 1 volume Annual Report of State Board of Health of Missouri. 1887.

- 1 volume Eleventh Annual Report of New Jersey State Board of Health. 1887.
- 1 volume Fifth Annual Report of the City of Providence, Rhode Island. 1887.
- 1 volume Fourth Biennial Report of Iowa State Board of Health. 1887.
- 1 volume Geological Survey of Ohio. Volume VI.
- 1 volume Tenth Annual Report of Connecticut State Board of Health. 1887.
- 1 pamphlet Proceedings of Pennsylvania State Sanitary Convention. 1886.
- 1 volume Seventh Biennial Report of Maryland State Board of Health. 1885.
- 1 pamphlet Proceedings of Sanitary Convention at Traverse, Michigan. 1887.
- 1 volume Seventh Annual Report of New York State Board of Health. 1887.
- 1 volume Report of Patho-Biological Laboratory, University of Nebraska.
- 1 volume Thirty-fourth Registration Report of Rhode Island. 1886.
- 1 volume Nineteenth Annual Report of Massachusetts State Board of Health. 1887.
- 1 volume Ninth Annual Report of Board of Health of the City of Atlanta. 1887.
- 1 volume House Journal, State of Delaware. 1887.
- 1 volume Report on Hygiene, New York State Board of Health. 1887.
- 1 volume Fifteenth Annual Report of Board of Health, City of New Haven. 1887.
- 1 volume Third Annual Report of Board of Health, City of Newark. 1887.
- 1 volume First Annual Report of Vermont State Board of Health. 1887.
- 1 volume Third Annual Report of Maine State Board of Health. 1887.
- 1 volume Sixth Annual Report of Indiana State Board of Health. 1887.
- 1 volume Tenth Annual Report of Rhode Island State Board of Health. 1887.
- 1 volume Sixth Annual Report of the Provincial Board of Health, Ontario. 1887.
- 1 volume Second Annual Report of Ohio State Board of Health. 1887.
- 1 volume Eighth Annual Report of New York State Board of Health. 1888.
- 1 volume Fifteenth Annual Report of Michigan State Board of Health. 1887.
- 1 pamphlet Proceedings and Addresses of Sanitary Convention at Manistee, Mich., June, 1888.
- 1 volume Seventh Annual Registration Report of New Hampshire. 1886.
- 1 pamphlet Report of the Sanitary State of the City of Montreal. 1887.
- 1 volume Second Annual Report and Vital Statistics of the Pennsylvania State Board of Health. 1886.
- 1 pamphlet Compendium of the laws relating to the public health and safety of the State of Pennsylvania. 1888.
- 1 volume Second Annual Report of Vermont State Board of Health. 1888.
- 1 volume Seventh Annual Report of New Hampshire State Board of Health. 1888.
- 1 volume Forty-sixth Registration Report of Massachusetts. 1887.
- 1 volume Tenth Biennial Report of California State Board of Health. 1886-1888.
- 1 volume Biennial Report of the West Virginia State Board of Health. 1887-88.
- 1 volume Sixth Annual Report of Board of Railroad Commissioners of Kansas. 1888.
- 1 volume Twelfth Annual Report of New Jersey State Board of Health, and Report of Vital Statistics. 1888.
- 1 pamphlet Report of State Board of Health of Massachusetts upon the Sewerage of the Mystic and Charles Rivers. 1889.
- 1 volume Twelfth Report (Fourth Biennial) of the State Board of Health and Vital Statistics of Minnesota. 1886-88.
- 1 pamphlet Water Supplies of Illinois and the Pollution of its Streams, by John H. Rauch, M. D., Secretary. 1889.
- 1 volume Fourth Annual Report of Board of Health, city of Newark, N. J. 1889.
- 1 volume Manual for the Board of Health of Massachusetts. 1887.
- 1 volume Second Annual Report Minnesota State Board of Health. 1874.
- 1 volume Third Annual Report Minnesota State Board of Health. 1875.
- 1 volume Fifth Annual Report Minnesota State Board of Health. 1876.
- 1 volume Sixth Annual Report Minnesota State Board of Health. 1878.
- 1 volume Seventh Annual Report Minnesota State Board of Health. 1879.
- 1 volume Eighth Annual Report Minnesota State Board of Health. 1880.
- 1 volume Biennial Report Minnesota State Board of Health. 1881-82.
- 1 volume Second Biennial Report of North Carolina State Board of Health. 1889.
- 1 volume Eleventh Annual Report of Connecticut State Board of Health. 1888.
- 1 volume Annual Report of the Health Department of the city of Baltimore. 1888.
- 1 volume Third Annual Report of Pennsylvania State Board of Health. 1887.
- 1 volume Ninth Annual Report of Illinois State Board of Health. 1886.
- 1 volume Fourth Annual Report of Michigan State Board of Health. 1876.
- 1 volume Twelfth Annual Report of Michigan State Board of Health. 1884.
- 1 volume Fourteenth Annual Report of Michigan State Board of Health. 1886.
- 1 volume Sixteenth Annual Report of Michigan State Board of Health. 1888.
- 1 volume Seventh Annual Report of Wisconsin State Board of Health. 1882.

- 1 volume Ninth Annual Report of South Carolina State Board of Health. 1888.
- 1 volume Fourth Annual Report of Connecticut State Board of Health. 1881.
- 1 volume Eighth Annual Report of Connecticut State Board of Health. 1885.
- 1 volume Report of the Board of Health of Alabama. 1887.
- 1 volume Sixth Biennial Report of Kansas State Historical Society. 1887-1888.
- 1 volume Eighth Annual Registration Report of New Hampshire. 1887.
- 1 pamphlet Proceedings and Addresses at a Sanitary Convention at Hastings, Michigan, December 3 and 4, 1888.
- 1 volume First Biennial Report of Iowa State Board of Health. 1881.
- 1 volume Laws of Kansas. 1889.
- 1 pamphlet Sixth Annual Report of the Superintendent of Health of City of Providence. 1888.
- 1 pamphlet Thirty-Fourth Annual Report upon Births, Deaths, and Marriages, Providence, R. I. 1888.
- 1 volume Third Annual Report of Ohio State Board of Health. 1888.
- 1 volume Third Biennial Report of State Board of Corrections and Charities of Minnesota. 1888.
- 1 volume Report of the State Librarian of Pennsylvania. 1887-1888.
- 1 volume Annual Report of the Board of Health of Louisiana. 1871.
- 1 volume Annual Report of Board of Health of Louisiana. 1873.
- 1 volume Annual Report of Board of Health of Louisiana. 1875.
- 1 volume Annual Report of Board of Health of Louisiana. 1877.
- 1 volume Annual Report of Board of Health of Louisiana. 1878.
- 1 volume Biennial Report of the Board of Health of Louisiana. 1886-1887.
- 1 volume Twelfth Annual Report of Wisconsin State Board of Health. 1888.
- 1 volume Report of the Patho-Biological Laboratory, University of Nebraska. 1889.
- 1 volume Twelfth Annual Report of the Health Commissioner, City of St. Louis. 1888-89.
- 1 pamphlet Transactions of Vermont State Medical Society. 1887.
- 1 volume Thirty-first Report of Vital Statistics, State of Vermont. 1887.
- 1 pamphlet Report of Proceedings of First Annual Convention of the North Carolina State Sanitary Association. 1889.
- 1 pamphlet Proceedings of the Quarantine Conference in Montgomery, Alabama. 1889.
- 1 pamphlet Fifth Annual Report of the Health Department of the City of San Antonio, Texas. 1889.
- 1 pamphlet First Annual Report of Health Department of the City of Mansfield, Ohio. 1889.
- 1 volume Seventh Annual Report of Provincial Board of Health of Ontario. 1888.
- 1 volume Transactions of the Tennessee State Medical Society. 1889.
- 1 volume Seventh Annual Report of the State Board of Health of Indiana. 1888.
- 1 volume Twentieth Annual Report of the State Board of Health of Massachusetts. 1888.
- 2 pamphlets Proceedings and Addresses at Sanitary Conventions, held at Otsego, Mich., May, 1889, and at Tecumseh, Mich., June, 1889.
- 1 volume First Biennial Report of Kansas State Horticultural Society. 1887-88.
- 1 volume Forty-seventh Registration Report of Massachusetts. 1888.
- 1 volume Fourth Annual Report of Maine State Board of Health. 1888.

LIST OF BOOKS IN LIBRARY.

Books and other publications have been received by gift and exchange, and placed in the library of the Board, during the year ending December 31, 1890, as follows:

- Three Health Journals, City of Mexico. 1889.
- Fourth Annual Report of Ohio State Board of Health. 1889.
- Pamphlet of Addresses at Sanitary Convention, held at Ludington, Michigan, in July, 1889.
- Pamphlet of Proceedings of the National Conference of State Boards of Health at Cincinnati, Ohio, May 4, 1888.
- Proceedings of the State Sanitary Convention at Lewisburg, Pa. 1889. (Pamphlet.)
- Tenth Annual Report of the Illinois State Board of Health. 1887.
- Annual Report Health Department City of Baltimore. 1889.
- Fourth and Fifth Annual Reports Bureau of Animal Industries, Washington, D. C. 1887-88.
- Proceedings of Sanitary Convention at Vicksburg, Michigan, December, 1889. (Pamphlet.)
- Proceedings of Sanitary Convention at Pontiac, Michigan, October, 1889. (Pamphlet.)
- The Manual of American Water Works, Eng. News. 1888.
- Annual Report of Surgeon General, U. S. M. H. S. 1887.
- Annual Report of Surgeon General, U. S. M. H. S. 1888.
- Annual Report of Surgeon General, U. S. M. H. S. 1889.
- Fifth Annual Report Bureau of Labor and Industrial Statistics, Kansas. 1889.

- Seventh Annual Report Board of Railroad Commissioners. 1889.
 Proceedings of American Society of Microscopists. 1889. (Pamphlet.)
 Proceedings of American Society of Civil Engineers. 1889. (Pamphlet.)
 Compendium of the Pennsylvania Laws Relating to Public Health. (Pamphlet.)
 Fifth Annual Report Board of Health, City of Newark, N. J. 1889. (Pamphlet.)
 Fourth Annual Report Board of Health, City of Newark, N. Y. 1888. (Pamphlet.)
 Ninth Annual Report New York State Board of Health. 1889.
 Eighth Annual Report State Board of Health, New Hampshire. 1889.
 Report on Med. Education, Med. College, and Med. Pr. Acts, in U. S. in 1865-1890, by Illinois State Board of Health.
 Twentieth Annual Report, New Jersey State Board of Health, and Vital Statistics. 1889.
 Biennial Report of the Louisiana State Board of Health. 1888-1889.
 Address of the Louisiana State Board of Health, to the people of the Mississippi valley. (Pamphlet.)
 Eighth Annual Report of Indiana State Board of Health. 1889.
 Proceedings of Interstate Convention of Cattlemen, Fort Worth, Texas, March, 1890. Pamphlet.
 Annual Report Missouri State Board of Health. 1888.
 Ninth Annual Report. 1888. Registration of births, marriages, divorces and deaths, New Hampshire.
 The Report of the Alabama State Board of Health. 1888.
 The Twelfth Annual Report of the Connecticut State Board of Health, and registration of births, deaths, marriages, and divorces. 1889.
 The Fifth Annual Report of the Maine State Board of Health. 1889.
 The Animal Parasite of Sheep, U. S. Agricultural Department. Report. 1890.
 The Twelfth Annual Report of the Rhode Island State Board of Health.
 Tenth Annual Report, New York State Board of Health.
 First Annual Report of Florida State Board of Health.
 Health Code of Towns and Villages in the State of Maryland. (Pamphlet.)
 Eighth Biennial Report of the Maryland State Board of Health. 1889.
 Register of Physicians in Pennsylvania by counties, from July 1, 1881, to December 1, 1888.
 Eighth Annual Report of the Provincial Board of Health of Ontario, Canada. (Paper.)
 Thirteenth Annual Report of the Health Commissioners of St. Louis, Mo. (Muslin.)
 Proceedings of the National Conference of the State Boards of Health; Seventh Annual Meeting. (Paper.)
 Seventy-first Annual Report of the Massachusetts State Board of Health. 1889. (Muslin.)
 Eleventh Biennial Report of the California State Board of Health. 1888-1890.

ANNUAL REPORTS OF COUNTY HEALTH OFFICERS.

The following is a list of counties from which annual Reports of County Health Officers have been received. These reports should command your attention. Read them carefully and give them a thorough examination, as they possess important and valuable information, and show evidences of faithful work:

| | | | | |
|-----------|-----------|-------------|---------------|------------|
| Brown. | Ellis. • | Labette. | Nemaha. | Russell. |
| Butler. | Ford. | Lane. | Ness. | Shawnee. |
| Chase. | Garfield. | Linn. | Osborne. | Sheridan. |
| Clay. | Geary. | Logan. | Ottawa. | Sherman. |
| Cloud. | Greeley. | Lyon. | Phillips. | Smith. |
| Coffey. | Harvey. | Marion. | Pottawatomie. | Stanton. |
| Comanche. | Hodgeman. | Meade. | Pratt. | Thomas. |
| Crawford. | Johnson. | McPherson. | Rawlins. | Wabaunsee. |
| Decatur. | Kearny. | Miami. | Reno. | |
| Douglas. | Kingman. | Montgomery. | Rooks. | |

COUNTY REPORTS.

HIAWATHA, BROWN Co., January 3, 1891.

J. W. Redden, M. D., Secretary State Board of Health—DEAR SIR: I send you herewith my report for the year ending December 31, 1890.

Since my appointment as County Health Officer, April 9, 1890, there has been an unusual condition of health. No epidemics worthy the name have visited our borders.

The case of glanders which occurred in June, and which was reported by me to the State Board early in July, is the only case of contagious disease to which my attention was called officially. The necessary steps were taken to isolate that case, and no others were inoculated either from him or the affected horses. I have been unable to get the treatment of the case from the physician in charge, but the man made a good recovery and was in good health at last report, although his neck was fearfully scarred and not entirely healed.

My report will be found complete as far as returns of marriages are concerned, but am sorry to report that I have received almost no returns from physicians of births and deaths. There seems to be a general understanding among them that the law is a dead letter, and therefore ignore it entirely. I have urged the matter upon the undertakers of this city, but they have disregarded the law so long with impunity, they continue to do so still.

The general sanitary condition of the county is good. A few cases of dead animals left unburied have been brought to my notice, and the nuisance attended to and abated.

I would suggest some further legislation, if necessary, to make the law effective in the matter of collection of vital statistics. It should be made the duty of some officer, other than the county health officer, to see that the law is enforced. As the doctors are the ones most derelict in their duties, it can hardly be expected that the

county health officers will be willing to antagonize the whole fraternity for the mere pittance most counties pay for the service.

Sincerely yours.

S. M. PRATT, M.D., *County Health Officer.*

EL DORADO, BUTLER CO., January 1, 1891.

J. W. Redden, M.D., Secretary State Board of Health, Topeka, Kansas—DEAR DOCTOR: I have the honor herewith to transmit to you my annual report as Health Officer for Butler county. You will perceive by reference thereto that the report is very incomplete, owing to apathy, negligence, or downright cussedness, I know not which of these. The law requires reports to be made to this office; they fail to do their duty. But very few of the registered physicians of this county make any report whatever, of either births or deaths. Some of them will report the births that come within their practice, but totally ignore the death reports. There is but one physician in this county who performs his whole duty in this matter. I have no marriage report to make, notwithstanding I have urged upon those legally authorized to perform the marriage ceremony to make returns of the same; have even caused to be sent out a blank return with each marriage license issued by the Probate Court, with a request that they be filled out and returned with the license; but, so far, my request and the law have been totally ignored.

I am pleased to report that the sanitary condition of Butler county never was better than during the year just closed. With the exception of the la grippe, at the beginning of the year, there has been but very little sickness of any kind, save a limited number of malarial cases, mostly of a mild type, some few, however, assuming a typhoid character.

Hoping that the Legislature will so amend the sanitary law as to make it obligatory upon clergymen, justices and physicians to make reports, I am

Respectfully yours, etc., J. A. MCKENZIE, M.D., *County Health Officer.*

COTTONWOOD FALLS, CHASE CO., January 25, 1891.

J. W. Redden, M.D., Secretary State Board of Health—DEAR DOCTOR: I have the honor to submit to you my report as Health Officer for the year 1890. I am sorry to say that I am not able to make as full and complete a report as is required by law, for the reason that not one physician, and but one midwife, has made a return of deaths or births during the year; so you readily observe that, so far as the vital statistics are concerned, I cannot report them; I can only make a report so far as my own personal duties are concerned. I earnestly hope our present legislators will strengthen the weak points of our present law, so as to make it operative. I am satisfied that it would become popular, and generally accepted by the people, and result in very great good.

We have had no appearance of any endemic or epidemic diseases in this county for the past year. I think there have been a very few isolated cases of scarlet fever, whooping-cough and measles, but no reports have been made of them by attending physicians. The general health of the county has been remarkably good. Our supply of ice, as well as that of the meat, has been of the very best; and our market houses have been kept neat and clean. They are too often neglected by the proprietors and health officers, and become a very dangerous source of disease. It should be looked after that animals are not slaughtered too soon after being driven rapidly, or while the blood and system are in a fever heat. I think that twenty-four hours is soon enough for such animals to be slaughtered. Such meat will engender zymotic diseases surely; also severe bowel complaints, a class of diseases hard to control.

C. E. HAIT, M.D., *County Health Officer.*

CLAY CENTER, CLAY CO., January 7, 1891.

J. W. Redden, M. D., Secretary State Board of Health—DEAR DOCTOR: During the year there have been reported to me thirteen deaths from consumption, eleven deaths from cholera infantum, two from typhoid fever, and one from scarlet fever. While cholera infantum has not been as prevalent as usual, yet the chief causes of this disease are due to bad water, bad milk, and bad hygienic surroundings. So far as I can learn, there has been no spread of contagious diseases through the public schools, or by means of public funerals, or infected clothing. The general sanitary condition of our public buildings and the county generally, is excellent. We have had five cases of small-pox, confined to one family. I made two efforts to secure full notes from the attending physician to make a special report, but failed. All the cases were of a mild type, and made good recoveries.

Very truly yours,

SAM. E. REYNOLDS, M. D., *County Health Officer.*

CONCORDIA, CLOUD CO., December 30, 1890.

J. W. Redden, M. D., Secretary State Board of Health—DEAR DOCTOR: I regret to have to make such an annual report to you as accompanies this communication; but it is the best that I can do under the circumstances. The most of the physicians, midwives, and ministers have learned that the law is defective, and that they are not compelled to comply with it; therefore they take no pains to do so. I hope we will get a better law soon. There has been no prevailing disease in this county since my last annual report. No endemics or epidemics within the last year. There was one death reported by Dr. Sawhill, that he was of the opinion was croupous diphtheria, but was not fully satisfied that it was. That was the only death reported during the year. Use your best endeavors to get us a better law, and I think it will be fairly respected. Hoping for better and more efficient laws, I remain,

Yours truly,

T. D. HALL, M. D., *County Health Officer.*

BURLINGTON, COFFEY CO., January 16, 1891.

J. W. Redden, M. D., Secretary State Board of Health—DEAR SIR: I send you by to-day's mail my annual report for the year 1890. There were reported to me during the year only 10 births, and the undertakers' burial-case permits show that there were 160 deaths. The physicians of the county pay but little attention to the law. We had an eruptive disease, resembling scarlet fever; it has been very prevalent, and apparently contagious; almost always accompanied with sore throat. In some of the families, the children would have the efflorescence without the sore throat; while other cases would have the eruption without the sore throat. Several schools were closed for a short time on account of the disease, which was no doubt scarlet fever.

There have been no instances reported of the spread of contagious diseases by means of public funerals, or by infected clothing. In one family, consisting of eight persons, all were sick with typhoid fever except the father. Two died, and two had hemorrhage of the bowels. The cause was traced to the use of well-water, rendered impure from drainage of a cess-pool into the well.

The general sanitary condition of the public buildings, and the county, is excellent.

Very respectfully yours,

WM. MANSON, M. D., *County Health Officer.*

COLDWATER, COMANCHE CO., January 5, 1891.

J. W. Redden, M. D., Secretary State Board of Health—DEAR DOCTOR: The year 1890 has been very remarkable for unusually good health throughout this entire county. We have had no epidemics of a prevalent or fatal type. There were quite a number of cases of influenza through December, some cases bordering on pneu-

monia, but all very mild. In the winter of 1890 la grippe prevailed quite generally, but of a mild character, and yielded readily to treatment. It is extremely healthy throughout the county—so much so that if the general sanitary condition of the county is still more improved, then all the practicing physicians would be compelled to leave for other fields of sickness and labor. No diseases have spread through the schools, nor any contagious diseases been communicated by means of public funerals or infected clothing. The sanitary condition of the public buildings is excellent. Respectfully yours, J. S. HALLIDAY, M.D., *County Health Officer*.

GIBARD, CRAWFORD Co., January 8, 1891.

J. W. Redden, M.D., *Secretary State Board of Health*—DEAR DOCTOR: I send you to-day my annual reports of births and deaths for 1890. I could not get the dates for marriage reports; few are returned to me; the probate judge did not keep such records. Thirteen deaths from la grippe and twenty-five from consumption have occurred in the county during the year. There were no cases of the spread of contagious diseases through the public schools, or by means of public funerals, or by infected clothing. The County Commissioners are alive to the importance of sanitary measures, and aid me in carrying out the rules and measures recommended by the State Board of Health. The sanitary condition of the school-houses and the public buildings is good.

Yours truly,

WM. H. WARNER, M.D., *County Health Officer*.

OBERLIN, DECATUR Co., December 31, 1890.

J. W. Redden, M.D., *Secretary State Board of Health, Topeka, Kansas*—DEAR DOCTOR: In presenting the annual report for 1890, I find very little to report, at least of a sensational character. The health of the county has been exceptionally good, though during the fourth quarter we have a slight epidemic of either "scarlatina," in a very mild form, or "scarlet rash," with no fatal results. Thus far my experience in this county, extending over a period of twelve years, goes to prove conclusively that an altitude of 3,000 feet, which is that of our county, has a very beneficial effect or influence upon any epidemic; as, for instance, the small-pox epidemic, occurring two years ago during which fifty-four persons contracted variola, and a very large number of cases of varioloid, and only one death, and that was from a complication of erysipelas. Three years ago we had an epidemic of this same "scarlatina," or scarlet rash, and only two deaths, and they were infants. It was a question whether this disease was the cause of death or not, as laryngeal and pulmonary symptoms were very prominent.

In regard to diphtheria, I have never yet seen or treated a typical case of this disease in the city of Oberlin, or in territory immediately adjacent. I have a considerable number of laryngeal cases, which I have diagnosed as "putrid sore throat," and which have yielded readily to disinfectant laryngeal treatment.

There have also been quite a number of cases of fever of a typhoid character, which we diagnosed as "typho-malarial fever." Many cases of this character were adult males, who had worked on lines of railway being constructed in southwestern and western Nebraska; and the water which they were compelled to drink was very strongly impregnated with alkali. During the last four years many of these cases have proved fatal.

We have no vegetation in sufficient quantity this year to render any portion endemic to any disease.

While there is a large amount of alkali in our soil, and as a sequence the water in our wells is impregnated to a great extent, I think its evil effects can be neutralized by boiling the water used for drinking purposes. The caloric condition eliminates the animalcular and unhealthy vegetable constituents, and the alkali, or

earthy matters, are precipitated and form a crust on the inner surface of the vessel used. I have recommended this course to be pursued by persons having a naturally bilious temperament, and where these directions have been followed beneficial effects have been the result in every case.

Another reason, I think, for the very favorable condition of health which exists, is due to the lack of rainfall during the past six months. The effect of this condition, I think, is that vegetation has become dried or desiccated, retaining all the nutriment without exhaling noxious gases or vapors which would render the air full of these gases and produce serious malarial disturbance; these are of course theories, but the present condition of the health goes to prove their correctness. Have had a few cases of measles, but nothing serious.

As regards the health of the city of Oberlin, I think that the water supplied by the public water-works system contains much less alkali than that taken from the upper or 23-foot stratum. Our system consists of 32 wells, 3-inch diameter, sunk to a depth of 46 feet. These wells are sunk or driven within an external area of a square of 90 feet on each side. Sixteen, or one-half, are all that are required at present to supply the demand. This water is conveyed in iron mains, and connecting pipes are also of same material, and which serves to neutralize the alkali in the water, and the effect has been, so far, of almost an entire absence of malaria in the city of Oberlin. Respectfully, A. W. BARITEAU, M.D., *County Health Officer*.

LAWRENCE, DOUGLAS CO., December 31, 1890.

J. W. Redden, M.D., *Secretary State Board of Health*—DEAR DOCTOR: I send you to-day my annual report. It is not as complete as I could desire it, but it is the best I can make from the reports made to me. We have had but few cases of scarlet fever—and they of a mild type—in the county, and none of them were reported as fatal. There have been but few cases of diphtheria, and they were quite mild, and none fatal. There have been less cases than usual of typhoid fever, and less fatality than formerly. We have had about the usual number of cases of consumption. The diarrheal diseases of children have been less prevalent than usual, and the principal causes have been hot weather and bad food. The general sanitary condition of our county would be greatly improved by ditching, and draining the Kansas and Wakarusa river bottoms. No contagious diseases have been communicated by means of public funerals, infected clothing, or through the schools. The general sanitary condition of the public buildings is good.

Yours truly, N. SIMMONS, M.D., *County Health Officer*.

HEALTH OFFICE, HAYS CITY, ELLIS CO., January 3, 1891.

J. W. Redden, M.D., *Secretary State Board of Health, Topeka, Kansas*—SIR: In compliance with the request of the State Board of Health, I would respectfully state that the sanitary condition of Ellis county has been most excellent during the year ending December 31, 1890. Although la grippe made itself felt, yet no serious results were known. The two cities (incorporated) Hays and Ellis, are in a most excellent sanitary condition. It is the aim of both city boards to clean up and help the sanitary officers. Of late much varicella has occurred, but happily it is only of slight duration and submits to easy treatment.

I must repeat as before, sanitary laws are not much observed. The Board of County Commissioners of Ellis county have given much assistance to have all persons vaccinated, and during last year 117 were thus vaccinated at the expense of the county.

The county jail contained 17 prisoners during the year. It is in good condition. At my request, the jail has been entirely overhauled, and is now properly venti-

lated. The prisoners receive good, wholesome food from the table of the sheriff, and receive humane treatment.

No deaths have been recorded at the County Clerk's office.

I am sir, very respectfully, your obedient servant.

H. B. KOHL, M. D., *County Health Officer.*

DODGE CITY, FORD Co., January 8, 1891.

J. W. Redden, M. D., Topeka, Kansas—DEAR DOCTOR: I herewith submit report for year ending December 31, 1890. It has been difficult, owing to the removal of some of our physicians, to get a report. It is impossible to make monthly reports, under existing circumstances. We have one case of diphtheria reported for the year; two of scarlet fever, and a regular epidemic of whooping-cough. There has not been a case of continued fever in the county during the past year. We sincerely hope that powers will be given to the Board which will enable us to make our reports more complete and prompt in the future.

Very truly yours, T. L. McCARTY, M. D., *County Health Officer.*

RAVANNA, GARFIELD Co., January 6, 1891.

J. W. Redden, M. D., Secretary State Board of Health—DEAR SIR: Inclosed please find report from Garfield county for the year ending December 31, 1890. There is but little to say.

We have enjoyed singular immunity from disease. The health of our people could not have been better, aside from la grippe, which affected nearly all our citizens in the early part of the year, one case ending fatally; and an epidemic of whooping-cough, which, however, claimed no victims. We had but a few cases of enteric fever, two cases fatal; making a total of three deaths.

The births reported are 18 in number, which is not correct, a number never having been reported. Of still-births, there was but one. We had only two marriages. The number of children of school age registered is 313. Our jail has had no occupants, and have but one patient in the asylum for the insane, at Topeka.

Yours very respectfully, HENRY C. SUESS, M. D., *County Health Officer.*

JUNCTION CITY, GEARY Co., January 1, 1891.

Dr. J. W. Redden, M. D., Secretary State Board of Health—DEAR DOCTOR: I herewith submit my annual report for the year ending December 31, 1890.

Our county has enjoyed an unusual degree of health during the past year. We have steered clear of epidemics of all kinds during the year. While we have had quite a number of cases of scarlet fever during the last quarter, no deaths are reported from the disease. We had fewer cases of typhoid fever than usual during the year, and very little malarial disease. Our city and county are in good sanitary condition, and our people are learning to depend more upon work, sanitary work, and less on prayer, for the prevention of disease, than formerly.

In 1889 our mortality roll reached 122; in 1890 it is only 92, and this includes the deaths occurring at Fort Riley, which I never included in previous reports. This shows a decrease in deaths of over 25 per cent., while our population has increased over 20 per cent. Our death reports are taken solely from the burial-case permits returned from the undertakers, and are full and complete. So few physicians make returns of deaths that my information from that source is worthless.

My birth reports are far from complete, several physicians not reporting at all. I am confident we have had over 200 births in the county during the year, while my reports show only 126. Among these were four pairs of twins and one of triplets.

All of which is respectfully submitted.

P. DAUGHERTY, M. D., *County Health Officer.*

TRIBUNE, GREELEY Co., January 6, 1891.

J. W. Redden, M.D., Secretary State Board of Health, Topeka, Kansas—DEAR DOCTOR: I send you by to-day's mail the annual condensed reports of marriages, births and deaths for the county of Greeley for the year 1890, which I am pleased to state are complete.

There has been a remarkable exemption from all contagious diseases during the entire year—and, in fact, from disease of any nature whatever. The sanitary condition of the county is good.

The number of deaths for 1890 is 13; the number of births, 29; the number of marriages, 9.

There have been fewer cases of typhoid and malarial fevers during the past year than ever before since the organization of the county.

Although a little late in forwarding my report, I hope you may receive it in time to use it as you may see proper.

Very truly yours,

F. R. MOORE, M.D., *County Health Officer.*

NEWTON, HARVEY Co., January 12, 1891.

J. W. Redden, M.D., Secretary State Board of Health—DEAR DOCTOR: Herewith find my report for 1890. I am satisfied the same is not complete, inasmuch as there is a disposition on the part of a few physicians to abstain from making reports.

The general health of the county has been above the average during the year, and I attribute it to the sanitary measures, which from year to year grow more perfect. Have had no cases of small-pox, therefore vaccination has been light. There have been deaths from diphtheria, 5; scarlet fever, 2; typhoid fever, 5. The summer and autumn months gave us but few cases of diarrhea and dysentery, with our usual limited number of malarial ailments, and 7 cases of phthisis, and 2 of rheumatism proving fatal. This is a general synopsis of deaths.

The marriage reports are quite complete; the report of births very meager.

The sanitary condition of public buildings far above the average.

Very truly,

G. D. BENNETT, M.D., *County Health Officer.*

JETMORE, HODGEMAN Co., January 5, 1891.

J. W. Redden, M.D., Secretary State Board of Health—DEAR DOCTOR: I herewith send you report of Hodgeman county. It is rather brief, since our county is considerably depopulated. We have had no epidemic or endemic during 1890, except whooping-cough; during November and December there have been 30 or 40 cases. There have been six or eight marriages in the county during the past year. I have not been able to get a report from the Probate Judge. I went to his office several times, but could never find him in, and have repeatedly requested him to report them to me, but he has failed to do so.

The health in general has been remarkably good. Have had no prevailing disease, save whooping-cough, and it was not severe in character. This is the second year our county has escaped an epidemic of typhoid fever, so common in the west. Five cases will cover all, and all of these were in one family. The doctor in attendance assured me that every nook and part of the premises was searched for the cause, but it was not found. No fatalities. Hodgeman is in as nearly perfect health as any county could be.

Very respectfully yours,

J. K. MILLER, M.D., *County Health Officer.*

OLATHE, JOHNSON Co., January 6, 1891.

J. W. Redden, M.D., Secretary State Board of Health—DEAR DOCTOR: I herewith send you by mail my third annual report of births, deaths, and marriages. The birth and death reports are not as complete as they ought to be, owing to the fact that some of our physicians have entirely ignored the requirements of the law.

The sanitary condition of the county, so far as I have been able to ascertain, has been very good. The health of the people has been excellent, no disease having prevailed to any extent during the past year, except about a year ago, when we had a general visitation of "la grippe"—usually in mild form.

The house on the poor-farm is far from being what it should be. There are twelve inmates. They are well fed and cared for very humanely by the present overseer and his good wife. Our jail is one of the very best, finished about a month ago, and now contains eighteen prisoners, but many of them will be disposed of this month.

There are in this county 6,159 persons of school age: males 3,147, females 3,012. The number in the schools is 4,762: males 2,480, females 2,282. Teachers, 123: males 60, females 63.

There is nothing further of general interest that I think of at present, except that the law requiring the returns of birth and deaths ought to be made more stringent; also, that there should be some definite price agreed upon for the services of the county health officers. That, I think, ought to be in proportion to the population of the respective counties. I do not suggest this change on my own account, for I have not the least expectation of serving another term; but I think justice demands it.

I am very respectfully your obedient servant,

C. G. McKINLEY, M. D., *County Health Officer.*

LAKIN, KEARNY CO., January 5, 1891.

J. W. Redden, Secretary State Board of Health—DEAR DOCTOR: I send you to-day my annual reports for 1890. They are somewhat similar to my reports for 1889—imperfect and deficient. I have endeavored to secure reports from all available sources, but a large part of the county has not responded. The physicians of the county are indifferent to the requirements of the Board of Health. However, I must express my obligations to Dr. Richards, of Hartland, for his assistance in making the reports as full as they are.

Scarlet fever and cholera infantum prevailed slightly in this portion of the county, but the cases were of a mild type. Typhoid and typho-malarial fevers have been prevalent in some portions of the county. The public school here has been closed on account of scarlet fever, but the disease is under control, and all precautionary measures are being exercised to stop its further spread.

The general sanitary condition of the public buildings and the county is very good.

No contagious diseases have been communicated, either by public funerals or by infected clothing. Southwestern Kansas is certainly noted for the extremely good health of its inhabitants. There is hardly enough sickness in this county to support a regular physician.

Fraternally yours, C. E. LOVIN, M. D. *County Health Officer.*

KINGMAN, KINGMAN CO., January 31, 1891.

J. W. Redden, M. D., Secretary State Board of Health—DEAR DOCTOR: I send you to-day my annual report for the year 1890. There have been reported 137 births, 83 marriages, and 29 deaths. Of the deaths, 2 were from consumption. There have been but few cases of cholera infantum during the past summer. There have been no epidemics nor endemics. In fact, the health generally throughout the county has been remarkably good. There have been no instances of the spread of any contagious diseases through the schools, or by means of funerals or infected clothing.

The sanitary condition of the public buildings and the county is excellent.

E. W. HINTON, M. D., *County Health Officer.*

OSWEGO, LABETTE CO., January 5, 1891.

J. W. Redden, M.D., Secretary State Board of Health, Topeka, Kansas—DEAR SIR: With but few exceptions, the physicians of this county have so completely failed to make reports of any kind during the year 1890, that my annual report can be but little more than a record of facts that have come under my own observation, or of which I have incidentally learned during the year. Bearing in mind this statement, I have to report that there has been more sickness among our people during the last year, than in any previous year since 1880. The increase consisted largely of cases of that form of epidemic influenza designated "la grippe." In the latter part of December, 1889, there were a few cases of this disorder, but not in sufficient numbers to attract attention to its prevalence. During the first week of January, however, it attacked us with vigor; and in the next four weeks about one-fourth or one-fifth of our people were prostrated. After raging violently for a month, it subsided, or passed over, as rapidly as it began. In February there were a few cases, and in March still fewer; in neither month were there so many cases that the prevalence of the disease would have been noticed but for its recent exploits. The inhabitants of the towns seemed to suffer most severely from the disease, and while it was most prevalent, the physicians were kept so busy attending them that it was almost impossible for country patients to get medical aid. However, la grippe, while very severe and painful, did not of itself prove fatal to an individual of ordinary vitality. A few old persons died, the immediate cause of death apparently being heart failure. The vital depression following la grippe was in most cases very great, and did not seem to be measured by the degree of severity of the primary attack. Other diseases following seemed to be more severe and fatal than usual, probably because of the vital depression spoken of above. No one disease was proportionally more severe than the others. The origin of several cases of consumption can be traced to the changes in the lungs brought about by la grippe, or to the vital depression following its primary attack, which in none of these cases was of the severest form.

In June the ordinary diseases of that season seemed more prevalent than usual; no particular one being especially so.

It is not a pleasant thing to record that typhoid fever—a preventable filth disease—is rapidly and steadily on the increase, but such is the fact. During the latter part of August, and all through September, October, and November, it was more prevalent by far than ever before in our county, where, until quite recently, a typical case originating here was of rare occurrence. We learn from this, not that our State and local boards of health are inefficient and useless, but that they should have more power and means to do sanitary work, and that they should receive more fully the coöperation of the physicians of the State, so that through them the people might learn the possibility and methods of completely controlling such diseases.

In the latter part of September and in October we had another visitation of epidemic influenza; this time of a more typical form than the previous epidemic, being characterized by catarrh of the upper air passages, and affecting most frequently children under ten years of age. It was not so prevalent nor so severe as the former attack, nor was it followed by the vital depression so characteristic of la grippe.

There have been reported to me, as occurring in the county during the last year, 73 deaths, 78 births, and 226 marriages. Death was caused by scarlet fever in two cases; by whooping-cough in two cases; by consumption of the lungs in ten cases; by typhoid fever in two cases; and by cholera infantum in three cases. I am confident this report does not record more than about one-sixth of the deaths actually occurring, and a less proportion of the births. This falling-off in the number of reported cases is mainly due to the disinclination of the physicians to take the time

and trouble and go to the expense of making reports for which they receive no remuneration whatever.

There have been no instances of the spread of contagious or of infectious diseases through the schools or by means of funerals. We have had, in one instance, scarlet fever brought into our midst by means of infected clothing. A lady had been to a neighboring city to nurse a grandchild sick with scarlet fever. After the child's recovery, the clothing the lady had worn was fumigated with burning sulphur, and then packed in a trunk or valise. In about two weeks after her return home one of the woolen dresses was taken out and worn as usual. In a few days after this another grandchild, making its home with her, was taken sick with scarlet fever, which could not be traced to any other origin than that of the woolen dress.

We have also had the whooping-cough introduced into our midst, in the same manner in two instances, during the last year. In the first case, a gentleman had been visiting, in the western part of the State, a family in which there were cases of whooping-cough. When ready to come home, the clothes worn while there were packed in a valise and not taken out after getting home for several days, probably about two weeks. After they were unpacked, and worn, the gentleman's two little girls promptly took the whooping-cough, which, in their cases, ran a typical course. Again, in the early part of the year, a young man of Oswego visited in Walnut, Kansas, where, at that time, whooping-cough was prevalent. After coming home his younger brothers and sisters, who had not previously had the disease, were taken ill with whooping-cough, and a few other cases originated from these; no deaths resulted. In each instance above cited, the persons spreading the disease had themselves had it in earlier years, and in neither case could the outbreak be traced to any other origin than that suggested.

During the year we have built a large, convenient, well constructed and ventilated jail, and the sanitary condition of all public buildings is now excellent. The general sanitary condition of the county is as good as the present knowledge of the people, and the somewhat limited power of the Board of Health, can make it.

The vaccination rule has never been very well observed, and was not called to the attention of the people during the last year. The registration rule has been disregarded in but few instances. One physician has registered during the year. Several have moved away, died, or ceased to practice, leaving but 50 physicians in actual practice. This does not include the Christian scientists, faith curists, Indian doctors, cancer doctors, and others of like character, among us in large numbers.

There are about 10,000 persons of school age in this county; perhaps 25 were vaccinated during the year. About 6,000 had been previously vaccinated, and about 4,000 were never vaccinated.

Malignant contagious diseases, such as diphtheria and scarlet fever, have made their appearance in our county a few times. In each instance the spread of the disease has been promptly checked by means of isolation, quarantine, and disinfection. Whenever the rules, regulations and directions of the State Board of Health are brought to the notice of the people, they comply with them readily, submitting to isolation, quarantine, and disinfection without a murmur.

Our present board of County Commissioners seem to favor any efforts to increase the safety of our people, or to improve the sanitary condition of the county.

Our water-supply is from wells and cisterns. Parsons and Oswego have each a system of water-works, supplying them with water; Parsons obtaining her supply from Labette creek, and Oswego from the Neosho river. But even in these towns most persons use well or cistern water for drinking and culinary purposes.

Our county is rolling, and intersected by numerous water-courses. This, together with a porous subsoil, gives us excellent natural drainage. We have no other, except

at Parsons, which has a system of sewerage. How satisfactory it is, I am unable to state. The porosity of our subsoil gives us excellent natural drainage, as suggested above; but it also increases the liability of the contamination of the water-supply with the germs of typhoid fever. This assumes special importance when we remember that under the most adverse circumstances such contamination will occur, unless the excreta of all patients suffering with typhoid fever is thoroughly disinfected. Such disinfection is but indifferently done by many of the untrained nurses who wait on our typhoid-fever patients: and I have known instances where intelligent, conscientious physicians have failed to call the nurse's attention to the need of any sort of disinfection. This only emphasizes the need of a State Board of Health which shall have the power and means to reach the people at frequent intervals with literature giving warning of the danger of these diseases, and teaching the best-known methods of controlling them.

The ice used during the year was manufactured. The supply was limited, and it was used sparingly. I am unable to say what effect it had on the public health.

Our meat, milk and vegetables are supplied by local dealers, whose reputation insures a good and wholesome supply. I am, very respectfully,

E. E. LIOGETT, M.D., *County Health Officer.*

DIGHTON, LANE CO., January 31, 1890.

J. W. Redden, M.D., Secretary State Board of Health—DEAR DOCTOR: I send you by mail to-day my annual report for the present year. No cases of scarlet fever have been reported during the year. Seventeen cases of diphtheria have been reported; nine of them were fatal. Two deaths from typhoid fever and four from consumption of the lungs have been reported. La grippe was quite prevalent throughout the county early in the year, but it was of a mild type. There have been no cases reported to me of the spread of contagious diseases through the schools, or by means of public funerals, or infected clothing.

The general sanitary condition of the county and of the public buildings is excellent.

Yours truly, F. S. ROUND, M.D., *County Health Officer.*

MOUND CITY, LINN CO., January 1, 1891.

J. W. Redden, M.D., Secretary State Board of Health—DEAR DOCTOR: Herewith I send my annual report for the year 1890. Scarlet fever has prevailed in the southern portion of our county, but it was of a mild type, and no deaths were reported from it. There have been reported to me eight deaths from diphtheria, five from typhoid fever, two from whooping-cough, and two from pernicious malarial fever.

There are thirty prisoners confined in the county jail, eight of whom are insane.

The County Commissioners do not let the poor-farm as formerly. They have made the buildings more commodious, and are entitled to great credit for the efficient and humane manner that everything is conducted.

I have gathered the number of deaths from the returns of the burial-case permits from the undertakers, and find there have been 193 cases sold by them during the year, not including December. There are 172 of the marriage returns in my possession, which are complete to January 1, 1891. There have been no cases of the spread of contagious diseases through the public schools, or by means of infected clothing, or public funerals. The general sanitary condition of the county and public buildings is excellent.

Very truly yours,

IRA E. COE, M.D., *County Health Officer.*

WINONA, LOGAN CO., December 31, 1890.

J. W. Redden, M.D., Secretary State Board of Health—DEAR DOCTOR: My annual report for the present year is sent you by to-day's mail. There were two cases of

scarlet fever reported to me, but neither of them was fatal. Five cases of typhoid fever were reported, but none were fatal. The diarrheal diseases of children has been rather prevalent during the hot weather, but only four fatal cases were reported. There were no cases of contagious diseases spread through the schools, nor by means of public funerals or infected clothing. The public buildings are kept in a neat and clean condition, while the sanitary condition of the county is remarkably fine.

B. B. MONTGOMERY, M. D., *County Health Officer.*

EMPORIA, LYON CO., January 8, 1891.

J. W. Redden, M. D., Secretary State Board of Health—DEAR DOCTOR: It is with pleasure that I can report that this county has not been visited with any epidemic during the last year. There have been a few cases of scarlet fever; the disease manifested itself in a mild form, rather endemic in character, with but few deaths. The same may be said of diphtheria. There have been a number of cases in different parts of the city, but in no case was it communicated from one family to another that I heard of; nearly as many adults as children were affected with the disease; there were a few cases west of Emporia, only two or three proving fatal. There have been some cases of malarial fever (by some called typhoid), a few cases proving fatal; but it was less prevalent than it has been for a number of years. No small-pox, consequently no vaccination. Pulmonary disease seems to be on the increase. The water- and ice-supply of the city has not changed since my last report. There is a commendable effort being made to have pure water for culinary purposes.

I again recommend the cremation system, spoken of in my last annual report.

The County Commissioners render a willing assistance in all necessary sanitary work. The public-school buildings are in fair condition. The jail remains the same as formerly reported.

The sanitary condition of the county has improved, and will compare favorably with the best in the State.

The physicians of the county make their returns commendably. There is an indifference on the part of some in the city. Dr. Page is worthy of commendation for full returns; while others are good men, they are actuated by different motives. If there was a compensation for each return, they would be more complete; correct reports need not be expected under the present law. The efforts being made to change the law are not made in this county. From a sanitary standpoint, a good sanitary law would be better than class legislation.

The returns of marriages is a failure in this county, both by ministers and probate judge. To get correct returns from all the undertakers has delayed this report. They have kindly furnished me the number of deaths in the county, outside of Emporia, amounting to 25. In Emporia, nothing; making a great contrast between the returns of physicians and undertakers, as you will see by the accompanying report.

Respectfully submitted. R. W. McCANDLESS, M. D., *County Health Officer.*

PEABODY, MARION CO., January 6, 1891.

J. W. Redden, M. D., Secretary State Board of Health, Topeka, Kansas—DEAR DOCTOR: I must confess to some disappointment in rendering this report. I had anticipated, during the past year, a more complete coöperation of physicians, midwives and probate judge; but they, evidently, in the usual rush and hurry, put these things off for a "more convenient season," and so forgot them altogether, or had no time at all. I wrote letters and cards to each physician; also sent circulars, urging the importance of this aid; but I find myself at the end of the year with fewer returns than the previous year.

The health of our residents has been comparatively good. There has been no epidemic of any of the contagious diseases. A few cases of typho-malarial fever have been reported, but the type of a mild character; hence, not many deaths. Scarlet rash has been reported from various parts of the county, but the disease did not spread, and no serious cases followed. Diphtheria has been reported from a few places, but the cases were generally of a mild type, and only a few deaths have been registered.

The reports of deaths and births have not been so generally returned as in last year. Only one physician and his wife (also a physician) have sent returns from Florence, and but one from Marion, the county seat, from whence we had hoped for the best returns—that is, the most complete. The place where the law should be most enforced is where it seems to be most disregarded. I have received returns from Hillsboro physicians; also Lincolnville, but none from Burns; while the physicians from Peabody have been very prompt in sending in their returns. Marriages were quite well reported for the earlier part of the year, by the Probate Judge, but later he has been unable to furnish these returns, for reasons unknown to me.

I think without any exceptions the practitioners of this county are registered. We have lost a few, and have gained two; one at Marion, and the other at Florence.

The sanitary condition of the cities of Marion county is about the same as last year.

During the past year this office has been called upon to furnish dates of death as well as births, thus making plain the importance of a full and accurate record of all vital statistics.

I hope, with other physicians, that this present Legislature will see the necessity of making it obligatory upon all physicians to make monthly reports of not only deaths and births, but also of all contagious and infectious diseases.

Since I have finished my condensed report I have received some twenty returns of deaths, about thirty births; some of these date back as far as July. I am sorry I cannot embody them in this report.

The public sentiment of our county is to have better and more efficient laws, and better protection for physicians. Surely we all need some efficient legislation on this subject.

I sincerely hope to be able, with the aid of my co-laborers, to give you a more rounded and complete report for Marion county in 1891.

I must not forget to add, and I do so with gratitude, that the County Commissioners have furnished a small, neat desk to the County Health Officer, in which to preserve all papers and books appertaining to this office.

I am, very respectfully yours, C. A. LOOSE, M. D., *County Health Officer.*

McPHERSON, McPHERSON Co., January 8, 1891.

J. W. Redden, M. D., Secretary State Board of Health—MY DEAR DOCTOR: Inclosed find my annual report. It is not complete, but as nearly so as I could make it under the circumstances. The greatest deficiency is in the return of deaths by the physicians; but upon the whole, it is an improvement over the past, and I will continue to make improvements as I have opportunity. It is extremely difficult to get the physicians properly in line. The health of the county has been fairly good. We suffered, however, very greatly during the first quarter from la grippe, the dregs of which still manifest themselves in many subjects. Several deaths occurred from it, usually complicated with pneumonia. There have been several cases of measles, whooping-cough, scarlet fever, diphtheria, and typhoid fever, but not sufficiently numerous or severe to be regarded as epidemic. The following is the death record of McPherson county, for the year ending December 31, 1890: 22

deaths from consumption, 17 from pneumonia, 17 from diarrheal diseases, 11 from measles, 10 from la grippe, 8 from heart disease, 7 from Bright's disease, 6 from cancer, 6 from dropsy, 6 from old age, 6 from premature birth, 6 from general debility, 6 from injury, 7 from convulsions, 5 from typhoid fever, 5 from croup, 5 from brain disease, 4 from whooping-cough, 4 from rheumatism, 4 from paralysis, 3 from diphtheria, 3 from gun-shot wounds, 3 from blood poisoning, 2 from scarlet fever, 2 from malarial fever, 2 from drowning, 2 from tumors, 2 from spinal meningitis, 1 from rupture, 1 from hemorrhage, 1 from teething, 1 from cramps, and the causes of 14 not given; making a total of 199. This computation is made from the burial-case permit record.

The general health at this writing is very good. Owing to my own ill-health I was not able to get my monthly and quarterly reports promptly this year, but will try and work to that plan the coming year.

Very respectfully submitted. J. E. ROUZE, M. D., *County Health Officer*.

MEADE. MEADE CO., January 22, 1891.

J. W. Redden, M. D., *Secretary State Board of Health*—DEAR DOCTOR: I send you by mail to-day my annual reports for the year 1890. Three physicians have left the county during the year. There have been reported to me sixteen marriages, eight births and six deaths. No cases have come to my knowledge of the spread of contagious diseases through the schools, or by means of public funerals, or infected clothing. The sanitary condition of the public buildings, school-houses, and the county in general, is excellent. We have had no epidemics or endemics.

Yours truly,

C. BUTTON, M. D., *County Health Officer*.

OSAWATOMIE, MIAMI CO., January 16, 1891.

J. W. Redden, M. D., *Secretary State Board of Health*—DEAR DOCTOR: To-day I send you my reports, as complete as it is possible to get them, considering the condition of the records when they came into my hands. I am withholding my quarterly report to hear from the State Insane Asylum here, and the county jail and poor-farm. Will forward it as soon as I receive the statistics from these institutions. There have been reported to me twelve deaths from consumption of the lungs, six from cholera infantum, three from scarlet fever, and one from typhoid fever. La grippe prevailed very generally during the early part of 1890, but it was of a mild type.

No instances have come to my knowledge of the spread of contagious diseases through the schools, or by means of public funerals, or infected clothing or other articles.

The general sanitary condition of the public buildings and of the county is excellent.

Very respectfully yours,

E. C. PACE, M. D., *County Health Officer*.

ELK CITY, MONTGOMERY CO., January 8, 1891.

J. W. Redden, M. D., *Secretary State Board of Health, Topeka, Kansas*—DEAR DOCTOR: Inclosed find with my annual report for 1890, in tabulated form, the return of marriages numbering 227; births, 177, and deaths, 46. This is incomplete, but is the best I can do after having stirred up the doctors two or three times during the year, by circular letters and special requests, urging them to make full and complete reports.

The health of the county has been good during the year, and we have been comparatively free from contagious or pestilential diseases. A few cases of scarlet fever have occurred in the county, but were closely quarantined and no general outbreak resulted. Typhoid fever has been less prevalent than usual, although a number of cases developed during the summer and fall, and a few cases exist at this time.

Measles were brought into the public schools of Elk City the latter part of November by a student who was not aware of exposure, and did not know what the trouble was until the eruption appeared. About forty cases developed, but no deaths have as yet resulted from this disease. Summer diarrhea was less prevalent than usual, and few deaths were reported from this cause. No cases of diphtheria were reported. Seven deaths from pulmonary phthisis were reported during the year.

The sanitary condition of the jail and poor-house is good. The number of inmates in the poor-house at this time is 14; in the jail, 13.

While this report is meager, it is all I can give from data at hand.

Very truly yours, J. T. DAVIS, M.D., *County Health Officer.*

SENECA, NEMAH CO., January 7, 1891.

J. W. Redden, M.D., *Secretary State Board of Health*—DEAR DOCTOR: Inclosed please find my annual report of births, deaths, marriages and registration for the year ending December 31, 1890. The number of births reported to me during the year was 169, number of deaths 34, and number of marriages 165. While this may be an average report of births and deaths for our county, I regret exceedingly that it is nothing like an accurate report of the total numbers.

Number of registered physicians practicing in the county, 32; of whom 28 are allopathic, and 4 homeopathic. I obtained the names and addresses of all registered physicians and midwives in the county from the county clerk, and from other sources obtained the names and addresses of other practicing physicians in the county, and opened a personal correspondence with each one. No response whatever was received from at least one-half of them, while several promptly and courteously replied, giving their reports in detail, and seemed anxious to assist me in making a complete report to the State Board.

So far as I am able to learn, the physicians who have reported this year are the ones who have been complying with the requirements of the State Board of Health ever since it was organized; and the majority of those not reporting are the ones who have never reported, and will not till they are paid for it or a rigorous law is enacted that will compel them to do so.

The County Commissioners are willing and anxious that the generally good sanitary condition of the county be maintained, as is evidenced by the care and attention given to the inmates of the jail and county poor-house and their surroundings.

There has been no epidemic of contagious diseases during the year. The few cases reported were isolated ones. According to several of the reports received, the physicians generally considered 1890 "distressingly healthy."

Very truly yours, ALICE G. H. ANDERSON, M.D., *County Health Officer.*

NESS CITY, NESS CO., January 6, 1891.

J. W. Redden, M.D., *Secretary State Board of Health*—DEAR DOCTOR: During the year there have been reported to me three deaths from scarlet fever, three from consumption, and two from diphtheria. La grippe, in the early part of the year 1890, prevailed in the county, but there were no deaths from it except in a few instances of old age. If more power was given to the State and local boards of health, together with a good medical-practice act, the general sanitary condition of our county would be greatly improved. There have been no contagious diseases spread through the public schools. The sanitary condition of the public buildings and the county in general is remarkably fine.

Truly yours, J. N. VENARD, M.D., *County Health Officer.*

OSBORNE, OSBORNE CO., January 9, 1891.

J. W. Redden, M.D., *Secretary State Board of Health*—DEAR DOCTOR: I send you

by mail to day my annual report of births, deaths, and marriages. There have been reported to me during the year 136 births, 88 marriages, and 87 deaths. Of the deaths, eleven were from consumption, three from cholera infantum, three from typhoid fever, and two from scarlet fever.

There have been no instances of contagious diseases being spread through the schools, or by means of public funerals, or by infected clothing.

The general sanitary condition of the public buildings and the county in general is excellent.

The County Commissioners seem anxious to use all proper measures to aid in enforcing all rules and requirements which will be beneficial in preventing epidemics, controlling and stamping out contagious diseases, and elevating the standard of public health.

Very truly yours, B. F. CHILCOTT, M. D., *County Health Officer.*

MINNEAPOLIS, OTTAWA Co., January 3, 1891.

J. W. Redden, M. D., Secretary State Board of Health—MY DEAR DOCTOR: I very highly appreciate the efforts of the State Board of Health, although I cannot at present do much to assist you. I had hoped to give you a full report, and with this view have waited, hoping to hear from physicians to whom I had sent requests for information. It seems each is afraid to compare work with his neighbor; and only two have responded. I would suggest that strenuous efforts be made this winter, to procure an act of the State Legislature, to enforce a record to be kept and reported by each practicing physician.

I have already begun my work for next year, but am afraid results will be meager. All I can help you now, is:

1. The number of licenses issued for 1890 is 104.
2. Number of coffins sold at Minneapolis, 70.
3. Number of deaths in county, about 90; births, about 220.
4. Sanitary condition of this city, fair, except sewage; drainage from hotel very bad, producing much miasm in its vicinity, and no effort by city council to stop it.
5. Considerable typhoid fever last fall. Nearly all traceable to defective sewerage from sink pipes.
6. County poor-farm in splendid condition and well superintended.

Yours very respectfully, J. F. BREWER, M. D., *County Health Officer.*

PHILLIPSBURG, PHILLIPS Co., January 2, 1891.

J. W. Redden, Secretary State Board of Health—DEAR SIR: My annual report will be incomplete, from the fact that I have been unable to secure the return of births, deaths, and marriages, as should have been reported to me. There have been reported to me 7 deaths from consumption, 2 from diarrheal diseases in children, 2 from diphtheria, and 1 from typhoid fever.

There has been no spread of contagious diseases through the schools, nor by means of public funerals, nor by infected clothing. One case of diphtheria in Phillipsburg has just been reported to me. The case is a boy about three years old. The danger of the spreading of the disease is not great, for the reason that the house has been posted with flag and all proper precautionary measures adopted.

The sanitary condition of the public buildings and the county in general is excellent.

Yours truly, H. WALLACE, M. D., *County Health Officer.*

WESTMORELAND, POTTAWATOMIE Co., January 8, 1891.

J. W. Redden, M. D., Secretary State Board of Health—DEAR DOCTOR: I mail you to-day my annual report, which I trust will be satisfactory.

The return of marriages numbers 102, and births 128. Scarlet fever has pre-

vailed in the southeastern and the northeastern portions of the county, but in a mild form.

The sanitary condition of the county is first class, as the doctors in each locality look to it, and as soon as any disease breaks out and proves to be contagious they immediately quarantine and see to the sanitary work.

Our public buildings are in good condition, and I might mention that I make a visit to the poor-farm every three months, and I have failed to find anything but what was just as it should be in regard to the sanitary condition.

The County Commissioners are in full accord with and ready to aid the county and State boards of health in enforcing all necessary measures for the benefit of the people.

Yours truly,

J. S. SPANGLER, M.D., *County Health Officer.*

PRATT, PRATT Co., January 12, 1891.

J. W. Redden, M.D., *Secretary State Board of Health*—DEAR SIR: The year just closed has been one of the most healthy of the last six. There has been a vast improvement in the health of the county since I came here in 1884, due to the fact of improved methods of living and shelter. There are a very few dug-outs here now, all new, comfortable frame buildings; some of them small, but yet comfortable, which accounts in a great measure for the improved health. Our water-supply is excellent, being derived from what is popularly called "sheet-water," by means of tubular wells, at a depth of from 70 to 120 feet below the surface; thus securing immunity from the damages to health caused by the use of surface-water.

A mild form of scarlet fever broke out in the public schools of the city of Pratt last September, and while there have been some very sick children, thanks to Providence and not to the efforts of the school board, there were no deaths. The action of this school board more than ever satisfies me of the necessity for more and definite power in the hands of the County Health Officer, to act in an emergency, with the right of appeal to the Secretary of the State Board of Health; and it is to be hoped the Legislature at its present session will confer the necessary power on said County Health Officer. As soon as it became known to me that scarlet fever, that scourge of childhood, was in our midst, I called the attention of the school board to it; but not until I told them I would telegraph you that scarlet fever had broken out in the schools and the board was inactive, did they act, and then they closed the schools for less than one week, and on reassembling it broke out again, and at least one child was confined to the house for six weeks by the disease and its sequela.

We have had but little typhoid fever and no deaths from it. The summer complaints of children have been less severe, and more amenable to treatment than in former years. La grippe made its appearance in this county shortly after I made my last annual report, and but few escaped its ravages. It left every one whom it attacked in a more or less debilitated condition, and many are suffering from its effects yet: in at least two cases a severe neuralgia followed, which for a time seemed almost impossible to relieve. There were but two deaths resulting from la grippe.

Our public schools have been unusually well attended; the number of pupils for the last year being 3,035.

The number of births reported seventy-five. The number of deaths, mostly obtained from undertakers' certificates, 35. Physicians seem averse to reporting them.

Taking it all in all, we have had a healthy and prosperous year. There are many things to be done, and many abuses to be corrected, that time and the intelligence of the people will do, and correct. Very respectfully yours,

THOMAS McELWAIN, M.D., *County Health Officer.*

LUDELL, RAWLINS Co., January 3, 1891.

J. W. Redden, M.D., *Secretary State Board of Health*—DEAR DOCTOR: I forward

herewith my annual report for the past year 1890. It is rather meager, due mainly to the fact that the doctors fail to make returns of their certificates.

We have had almost a failure of crops of all kinds in consequence of the drouth, and as a result the county has become greatly depopulated. Among those who left were four practicing physicians. Those who remained are of that class who either held a surplus, or were able to purchase supplies to carry them through, and in point of numbers they are decidedly in the minority.

I have only received certificates from two physicians, and I had to go to their offices to get them: while the undertakers have made returns very promptly. The law should be more stringent. We have been favored with a very healthy year, for there has been but little sickness in general. I was informed that diphtheria had been quite prevalent in Herndon, a small village in the northeast part of the county. I wrote at once to Dr. Pickler, the resident physician, for full particulars, and in a few days I received from him the following explanatory letter:

HERNDON, RAWLINS Co., December 31, 1890.

J. S. Constable, M. D., County Health Officer—DEAR DOCTOR: Your favor came to hand. Diphtheria is stamped out completely in this neighborhood. I had two deaths; all the other cases—eleven or twelve in number—recovered. I had the public school closed upon the first appearance of the disease, and used all possible preventive measures, and succeeded admirably in stamping out the disease.

Yours respectfully,

J. PICKLER, M. D.

There have been no contagious diseases spread through the public schools, or by means of public funerals, or infected clothing. The sanitary condition of the public buildings is excellent.

I am very truly yours, J. S. CONSTABLE, M. D., *County Health Officer*.

HUTCHINSON, RENO Co., January 31, 1891.

J. W. Redden, M. D., Secretary State Board of Health—DEAR DOCTOR: I send herewith very incomplete report as Health Officer for this county for the year 1890. I regret its incompleteness, and still more regret the causes for said incompleteness.

On my acceptance of the appointment as Health Officer, I issued a card to the medical profession of our county, asking their coöperation and assistance, in order that I might be able to make out an intelligent report.

I regret to say my request has not been heeded. A few (very few) have made careful reports. Others have, when spoken to on the subject, excused themselves by claiming carelessness and forgetfulness (but never making a report), while some have absolutely refused to make any report—claiming that no law could compel them to make a public record of their private business. Finding it would be impossible to make a complete report, I have not taken the pains to make the report I now make, as thorough as I could, or as I would have been pleased to do. As to births, I find not one in ten is reported, and these are incomplete. I might say the report of a birth requires some trouble on the part of the accoucheur, which he might avoid if he would have some forethought, and carry the blanks in his obstetrical case. In any common case of labor, the family are very communicative and do not hesitate to give all the information required; but after the physician has left the bedside of his patient, he finds trouble in obtaining information. The name of the infant is another drawback to the physician, and the parent should be compelled to furnish that information. By so doing, we would then know the exact number of births, if we obtained nothing more. I do not know sure, but I believe that one-half of the births (perhaps more) in Reno county, are conducted without the aid of a physician or midwife. Distance, impecuniosity and stinginess are the prime factors that lead to this state of affairs. "Don't have time to ride ten to twenty miles;" "Feel too poor to pay the expense"—too stingy to do so. Grandmother Jones is sent for, not as a midwife, but because she is a good old lady.

raised a large family, and has, on a pinch, "put a woman to bed." She comes, and the little he or she comes in spite of surroundings. Grandmother Jones steps in, ties the cord, pulls away the secundines, and the proud father boasts a new baby, chuckles that it didn't cost anything; and nobody has any legal knowledge of that birth, until the young man offers to vote or the young lady wants to get married.

We can never enforce a law until we have a penalty, and the duty and penalty should hold the parent, instead of the physician, for general statistics.

I send herewith the report of burial permits, as given by the undertakers—not by physicians—and the reported cause of death. Of course there is nothing reliable in the report, and yet some information as to character, or rather class, as so-called consumption may not be tuberculous, but would be some lung disease.

I hope our present Legislature will do something to make present laws effective, or make new ones. I had a conversation with the Representative of the ninety-second district, Mr. Freeman. He expressed himself as to the need of such law, and promised to do all he could to support the enactment of some reasonable law.

Very respectfully,

A. W. McKINNEY, M. D., *County Health Officer.*

STOCKTON, Rooks Co., January 5, 1891.

J. W. Redden, M. D., Secretary State Board of Health—DEAR DOCTOR: I send you by mail to-day my annual report for the year 1891. Mumps, of a peculiar form, has prevailed in Stockton and vicinity. The sanitary condition of buildings, including jail, school-houses, academies, and churches, is good. A persistent effort has been made by the County Health Officer to impress on the minds of the people the danger of neglecting the proper sanitary condition about their homes, and the public buildings. It has been insisted that dead animals should not be left above-ground, and that all streets and alleys should be kept free from manure and garbage.

It has been somewhat difficult to impress the average citizen with the importance of sanitary measures, and the ignorance on that matter among the people, otherwise intelligent, is very surprising. There are many people of general intelligence on most topics who are exceedingly ignorant of the danger to themselves and families of the condition of their premises, wells, and out-buildings. But there are two other sources of danger which are more threatening to the health of the community than any other. I refer to the water- and milk-supplies. The danger from impure water has long been conceded by intelligent laymen, and most people are aware of imbibing the germs of disease through this channel; but milk has generally been deemed harmless. No greater mistake can be made. A dairyman with diseased cows, or whose herd is supplied with impure water, may spread disease throughout a town or city, where all the sanitary surroundings are excellent. It should be no longer a controverted question, that typhoid fever, diphtheria, and even consumption, may be communicated to a community, otherwise healthy, through the channels of the dairy, or milk-supply. It is of vital importance, therefore, if we wish to do good, prophylactic work, that we keep a watchful eye on the milk-supply, the butcher, as well as the home surroundings.

Very truly yours, E. J. DONNELL, M. D., *County Health Officer.*

RUSSELL, RUSSELL Co., January 7, 1891.

J. W. Redden, M. D., Secretary State Board of Health—DEAR DOCTOR: My annual report for 1890 will be brief, for want of material. The total number of marriages returned is 53, all of whom are white. The returns of births are so few that it is far below the accurate number. One undertaker reports 35 deaths. No epidemics have prevailed in this portion of the State.

There have been no contagious diseases spread through the schools; nor communicated either by public funerals or infected clothing.

The sanitary condition of our jail is good, while the sanitary condition of our county is excellent.

The Board of County Commissioner will endeavor to increase the interest of physicians and the public during the present year in sanitary matters and preventive measures. Very respectfully yours, J. W. ROBB, M. D., *County Health Officer*.

TOPEKA, SHAWNEE CO., January 5, 1891.

J. W. Redden, M. D., *Secretary State Board of Health*—DEAR DOCTOR: I send you my annual report to-day of births and deaths. During the year 231 births have been reported to me—a falling-off from last year of over one hundred. On the other hand, there has been a gain in the death returns, having recorded 260. We have had no epidemic during the year. Scarlet fever has been with us all the year, but in a mild form, and few reported cases. Small-pox appeared in two localities only, but it was detected readily, quarantined, and suppressed. Diphtheria has been scarce, if I may judge by the number of cases reported—only 14.

The sanitary condition of our city and county is good. During the year there have been reported to me 97 cases of scarlet fever, with 2 deaths; 26 cases of typhoid fever, with 3 deaths; 17 cases of diphtheria, with 3 deaths; 51 deaths from consumption; and 16 deaths from cholera infantum. Compared with other years, but few cases of cholera infantum have been reported, and they were of a mild type. Impure water, improper food (as meat, potatoes and other vegetables), and continued high temperature, have been the principal causes of the last-named disease.

The general sanitary condition of our city and county could be improved by condemning and closing up all infected wells, requiring the city water-works company to furnish water from above the State Insane Asylum, and compelling householders to keep all privy vaults and cess-pools in a clean condition, or, better still, to condemn and declare all of them nuisances.

While I have not known of the spread of contagious or infectious diseases through the schools or by means of infected clothing, yet I wish to call the special attention of the reader to and emphasize the following facts: Scarlet fever attacked two children of a family early in February, one child dying. The house was thoroughly fumigated. In May a relative baby was frequently taken to the house without developing or contracting the disease. On one occasion a doll of the diseased child, with which she had played during the desquamation stage, was taken from a trunk and given to the baby. Inquiry developed the fact that the doll had been carelessly packed in the trunk without fumigation. The baby developed the disease in about a week from the first day of playing with the doll. The general sanitary condition of the public buildings and the school-houses is very good.

The County Commissioners are active, and ready to aid in maintaining all necessary sanitary measures for the prevention and suppression of disease, and for the benefit of the public health. Yours fraternally,

W. A. WILLIAMSON, M. D., *County Health Officer*.

GOODLAND, SHERMAN CO., January 6, 1891.

J. W. Redden, M. D., *Secretary State Board of Health*—DEAR DOCTOR: The health throughout our county during the year 1890 has been unusually good. We have had no epidemic of any character prevalent. There have been reported to me two deaths from typhoid fever, and two from cholera infantum. No contagious diseases have spread through the schools, neither any spread by means of public funerals nor infected clothing. The sanitary condition of our public buildings is excellent.

Yours respectfully,

M. A. RUSSELL, M. D., *County Health Officer*.

HOXIE, SHERIDAN Co., December 31, 1890.

J. W. Redden, M.D., Secretary State Board of Health—DEAR DOCTOR: My annual reports for the present year are herewith submitted. We have had no scarlet fever during the year. There have been six cases of diphtheria, and three of them were fatal; four cases of typhoid fever were reported, and all recovered. Diarrheal diseases among the children have not been at all prevalent; but two fatal cases were reported. Defective location has been the chief cause of this disease. La grippe was quite prevalent during the early part of the year, but it was of a mild type.

No contagious diseases have been communicated through the schools, nor by means of public funerals, nor by infected clothing.

This county is exceedingly healthy.

The sanitary condition of our jail is very poor; but that of the school-houses and the other public buildings is excellent.

There have been a few cases of typho-malarial fever in the county, but not as many as usual.

The physicians' returns of births and deaths are scarce; they do not seem to realize the importance of complete vital statistics.

Respectfully yours,

J. A. WINTERNITZ, M. D., *County Health Officer*.

LEBANON, SMITH Co., January 7, 1891.

J. W. Redden, M.D., Secretary State Board of Health—DEAR DOCTOR: The County Commissioners are anxious to do more in sanitary reform, and hope during 1891 that the physicians and the public may be ready and willing to coöperate heartily with the County Health Board in promptly adopting and faithfully executing all rules and measures which will prevent disease, control epidemics, and promote the health of the people. Diphtheria is prevailing in several localities, but of a mild type, while there are a few cases of scarlet fever.

The sanitary condition of the public buildings is excellent.

Yours truly,

W. C. BOWER, M. D., *County Health Officer*.

JOHNSON CITY, STANTON Co., January 22, 1891.

J. W. Redden, M.D., Secretary State Board of Health—DEAR DOCTOR: I send you by mail my annual reports of births, marriages, and deaths. My reports are not as complete as desired, but I have done the best I could. I made personal visits to the physicians and the Probate Judge, so as to make my returns full and complete, but found they had failed to keep or make a perfect record of them. Hope to make a decided improvement during the year 1891.

The general sanitary condition of the jail, court-house and school-house, as well as the county in general, is excellent. We have had but little sickness, and no epidemics or endemics. Yours truly,

C. A. CULVER, M. D., *County Health Officer*.

COLBY, THOMAS Co., January 7, 1891.

J. W. Redden, M.D., Secretary State Board of Health—DEAR DOCTOR: During February and March, 1890, la grippe was quite prevalent in this county. It was quite fatal with those persons afflicted with phthisis, and with children. Four deaths from consumption, two from typhoid fever, one from diphtheria, and one from cholera infantum, have been reported. There has been no spread of contagious diseases through the schools, nor by public funerals or infected clothing.

The sanitary condition of our court house, jail, and school-houses is very good.

Very truly yours,

V. C. EDDY, M. D., *County Health Officer*.

ALMA, WABAUNSEE Co., January 8, 1891.

J. W. Redden, M.D., Secretary State Board of Health—DEAR DOCTOR: I send you by mail to-day my annual reports of births and deaths. There have been reported

to me ten deaths from consumption, four from typhoid fever, two from scarlet fever, one from diphtheria, and five from cholera infantum; the latter disease has not been as prevalent as usual, as there have been but few cases during the year 1890. La grippe was very prevalent during the months of December, 1889, and January, February and March, 1890. There were but few deaths resulting from it; a severe and very prominent symptom, especially in the last cases that appeared, was a severe pain in the head.

The county poor-house is a large stone house, and the rooms are of good size, airy, and kept neat and clean. There are at the present time ten inmates; most of them are old and infirm. Six are white, four are colored; seven are of American and three are of German nationality.

The sanitary condition of the public buildings and school-houses is good. There was complaint about the jail, and I had it disinfected and renovated, so that it is now in a good, healthy condition.

Yours truly,

E. W. ELDRIDGE, M. D., *County Health Officer.*

VITAL STATISTICS.

The following is a list of counties, and number of births in each, that were reported to the Secretary of the State Board of Health, by the county health officers and physicians, for the years 1888, 1889, and 1890:

| <i>Counties.</i> | <i>1888.</i> | <i>1889.</i> | <i>1890.</i> |
|-------------------|--------------|--------------|--------------|
| Anderson..... | 24 | 185 | ..... |
| Atchison..... | 26 | 16 | 9 |
| Bourbon..... | ..... | 144 | ..... |
| Butler..... | ..... | 134 | 115 |
| Brown..... | ..... | ..... | 16 |
| Chase..... | 113 | 54 | ..... |
| Cheyenne..... | ..... | 6 | ..... |
| Clay..... | 85 | 77 | 58 |
| Cloud..... | 54 | 8 | ..... |
| Colley..... | 16 | ..... | 10 |
| Comanche..... | 53 | ..... | 38 |
| Crawford..... | 598 | 350 | 261 |
| Decatur..... | 167 | 106 | 73 |
| Dickinson..... | ..... | 6 | 4 |
| Doniphan..... | 45 | 27 | 3 |
| Elk..... | 70 | ..... | ..... |
| Ellis..... | 25 | 22 | 47 |
| Ellsworth..... | 113 | 101 | 88 |
| Finney..... | 103 | 46 | 55 |
| Ford..... | 149 | 105 | 45 |
| Franklin..... | 83 | 61 | 45 |
| Garfield..... | 29 | 31 | 18 |
| Geary..... | 128 | 132 | 126 |
| Gove..... | ..... | 1 | 1 |
| Graham..... | 44 | 45 | ..... |
| Gray..... | 12 | 1 | ..... |
| Greeley..... | ..... | ..... | 29 |
| Greenwood..... | 94 | ..... | 74 |
| Harvey..... | 148 | ..... | 28 |
| Hodgeman..... | 35 | 38 | 27 |
| Jackson..... | 28 | 18 | 15 |
| Jefferson..... | 56 | 38 | 9 |
| Jewell..... | 92 | 88 | 58 |
| Johnson..... | 245 | 208 | 113 |
| Kearny..... | ..... | 18 | 22 |
| Kingman..... | 265 | 149 | ..... |
| Labette..... | 170 | 138 | 78 |
| Lane..... | 54 | 28 | 28 |
| Leavenworth..... | 73 | 20 | 8 |
| Lincoln..... | 156 | 136 | ..... |
| Linn..... | 244 | 89 | ..... |
| Lyon..... | 194 | 39 | 40 |
| Marion..... | 183 | 212 | 248 |
| Marshall..... | 307 | 345 | ..... |
| McPherson..... | 106 | 170 | 133 |
| Miami..... | 134 | 118 | 43 |
| Meade..... | ..... | 24 | ..... |
| Montgomery..... | 238 | 168 | 177 |
| Nemaha..... | 298 | 139 | 169 |
| Neosho..... | 29 | 11 | ..... |
| Ness..... | ..... | 88 | 33 |
| Norton..... | 58 | 55 | ..... |
| Osage..... | 275 | 178 | 132 |
| Osborne..... | 211 | 176 | 136 |
| Pawnee..... | 41 | ..... | ..... |
| Phillips..... | 97 | 103 | 49 |
| Pottawatomie..... | 194 | 210 | 128 |
| Pratt..... | 120 | 95 | ..... |
| Rawlins..... | 76 | 18 | 31 |
| Republic..... | 3 | ..... | 3 |
| Rooks..... | ..... | 48 | ..... |
| Rush..... | 26 | ..... | ..... |
| Russell..... | 63 | 40 | ..... |
| Saline..... | 169 | ..... | ..... |

VITAL STATISTICS, (BIRTHS.)—CONCLUDED.

| <i>Counties.</i> | 1888. | 1889. | 1890. |
|------------------|-------|-------|-------|
| Scott..... | | 30 | |
| Sedgwick..... | 181 | 428 | |
| Shawnee..... | 442 | 372 | 231 |
| Sheridan..... | 18 | | 29 |
| Sherman..... | 56 | 83 | 67 |
| Stanton..... | | 8 | 18 |
| Stevens..... | 11 | 15 | |
| Thomas..... | 150 | 79 | 79 |
| Wabunsee..... | 188 | 103 | 196 |
| Washington..... | 48 | | |
| Wichita..... | 67 | 76 | |
| Wilson..... | 226 | 162 | 71 |
| Woodson..... | 169 | 69 | |
| Wyandotte..... | | 2 | 2 |
| Totals..... | 7,978 | 6,325 | 3,470 |

Below and on subsequent pages will be found synopses of the annual reports of births, deaths and marriages as returned by the county health officers and physicians in the several counties of the State for the year 1890, and reported to this office, a careful examination of which will be of special interest.

BIRTHS.

In ARCHISON county, the total number of births returned is 9. Of these, 4 were males and 5 females; all were white; 3 were the second child of mothers, 3 the third, 2 the seventh, 1 not given; all were born in cities and towns of 5,000 or over population; 3 mothers were between 21 and 25 years of age, 1 father and 2 mothers between 26 and 30, 5 fathers and 1 mother between 31 and 35, 1 father and 2 mothers between 36 and 40, 1 father and 1 mother not given; 7 fathers and 7 mothers were of American nationality, 1 father of English, 1 father of German, 1 father and 1 mother not given.

In BUTLER county, the total number of births returned is 115. Of these, 51 were males, and 55 females, and the sex of 9 not given; all were white; 23 were the first child of mothers, 26 the second, 22 the third, 9 the fourth, 7 the fifth, 6 the sixth, 1 the seventh, 5 the eighth, 2 the ninth, 1 the tenth, 11 not given; 1 mother was under 15 years of age, 7 mothers between 16 and 20; 16 fathers and 43 mothers between 21 and 25, 29 fathers and 22 mothers between 26 and 30, 21 fathers and 17 mothers between 31 and 35, 14 fathers and 13 mothers between 36 and 40, 13 fathers and 1 mother between 41 and 45, 4 fathers between 46 and 50, 1 father over 55; 17 fathers and 11 mothers not given; 104 fathers and 109 mothers were of American nationality; 2 fathers and 1 mother of German. The nationality of 7 fathers and 5 mothers was not given.

In BROWN county, the total number of births returned is 16. Of these, 8 were males, 8 females; 15 were white, 1 colored; 6 were the first child of mothers, 5 the second, 2 the third, 1 the fifth, 2 the sixth; 8 were born in cities and towns of 500 to 5,000 population, 8 in towns of less than 500 population, and in the country; 4 mothers were between 16 and 20 years of age, 1 father and 3 mothers between 21 and 25; 7 fathers and 7 mothers between 26 and 30; 4 fathers and 1 mother between 31 and 35; 2 fathers and 1 mother between 36 and 40; 1 father between 41 and 45; 1 father between 46 and 50; 15 fathers and 15 mothers were of American nationality, 1 father and 1 mother of Scandinavian.

In CLAY county, the total number of births returned is 58. Of these, 28 were males, 30 females; 54 were white, 4 colored; 7 were the first child of mothers, 9 the second, 9 the third, 9 the fourth, 5 the fifth, 7 the sixth, 2 the seventh, 2 the eighth, 3 the ninth, 3 the tenth, 2 not given; 11 were born in cities and towns of 500 to 5,000 population, 47 in towns of less than 500 population, and in the country; 1 mother was under 15 years of age, 7 mothers between 16 and 20, 6 fathers and 13 mothers between 21 and 25, 12 fathers and 12 mothers between 26 and 30, 9 fathers and 12 mothers between 31 and 35, 10 fathers and 8 mothers between 36 and 40, 11 fathers and 3 mothers between 41 and 45, 4 fathers between 46 and 50, 2 fathers between 51 and 55, 2 fathers over 55, 2 fathers and 2 mothers not given; 32 fathers and 31 mothers were of American nationality, 2 fathers and 2 mothers of British North-American, 2 fathers and 1 mother of English, 1 father and 1 mother of Irish, 4 fathers and 6 mothers of German, 16 fathers and 17 mothers of Scandinavian, 1 father of Austrian.

In COMANCHE county, the total number of births returned is 38. Of these, 24 are males, and 14 females; all were white; 4 were the first child of mothers, 15 the second, 9 the third, 4 the fourth, 1 the fifth, 1 the sixth, 1 the seventh, 1 the eighth, 1 the eleventh and more, and 1 not given; 8 were born in cities and towns of 500 to 5,000 population, 30 in towns of less than 500 population, and in the country; 2 mothers were under 20 years of age, 4 fathers and 13 mothers between 21 and 25, 17 fathers and 12 mothers between 26 and 30, 10 fathers and 8 mothers between 31 and 35, 6 fathers between 36 and 40, 1 father between 41 and 45; 30 fathers and 30 mothers were of American nationality, 1 father and 1 mother of Scotch, 7 fathers and 7 mothers of German.

In CRAWFORD county, the total number of births returned is 261. Of these, 116 were males, 143 females, 2 were not given; 257 were white, 4 colored; 64 were the first child of mothers, 42 the second, 29 the third, 32 the fourth, 23 the fifth, 23 the sixth, 18 the seventh, 10 the eighth, 4 the ninth, 1 the tenth, 7 the eleventh and more, 8 not given; 63 were born in cities and towns of 5,000 or over population, 86 in cities and towns of 500 to 5,000 population, 106 in towns of less than 500, and in the country; 1 mother was under 15 years of age, 34 mothers between 16 and 20, 39 fathers and 76 mothers between 21 and 25, 70 fathers and 57 mothers between 26 and 30, 55 fathers and 48 mothers between 31 and 35, 50 fathers and 30 mothers between 36 and 40, 25 fathers and 8 mothers between 41 and 45, 10 fathers and 1 mother between 46 and 50, 2 fathers between 51 and 55, 1 father over 55, 9 fathers and 6 mothers not given; 194 fathers and 202 mothers were of American nationality, 1 father of British North-American, 5 fathers and 10 mothers of English, 2 fathers and 1 mother of Irish, 3 fathers and 3 mothers of Scotch, 34 fathers and 29 mothers of German, 1 father and 1 mother of Austrian, 3 fathers and 2 mothers of Polish, 7 fathers and 6 mothers of French, 1 father and 1 mother of Swiss, 1 father and 1 mother of Dutch, 2 fathers and 1 mother of Italian, 1 father and 1 mother of Belgian, 7 fathers and 1 mother of other; there were 6 pairs of twins, 5 still-births.

In DECATUR county, the total number of births returned is 73. Of these, 37 were males, 36 females; all were white; 19 were the first child of mothers, 15 the second, 11 the third, 10 the fourth, 6 the fifth, 3 the sixth, 3 the seventh, 4 the eighth, 2 the ninth; 29 were born in cities and towns of 500 to 5,000 population, 44 in towns of less than 500 population, and in the country; 6 mothers were under 20 years of age, 7 fathers and 22 mothers between 21 and 26, 23 fathers and 18 mothers between 26 and 30, 9 fathers and 15 mothers between 31 and 35, 18 fathers and 8 mothers be-

tween 36 and 40, 9 fathers and 3 mothers between 41 and 45, 5 fathers between 46 and 50, 1 father between 51 and 55; 64 fathers and 64 mothers were of American nationality, 3 fathers and 2 mothers of British North-American, 3 fathers and 2 mothers of Irish, 1 father and 2 mothers of German, 1 father of Swiss, 1 mother of Swiss. There was 1 pair of twins.

In DICKINSON county, the total number of births returned is 4. Of these, 3 are males, 1 female; all were white; 1 was the first child of mothers, 1 the third, 1 the fifth, 1 the eighth; all were born in towns of less than 500 population, and in the country; 1 mother was under 20 years of age, 1 father between 21 and 25, 2 fathers and 2 mothers between 31 and 35, 1 father between 51 and 55, 1 mother between 36 and 40; 3 fathers and 3 mothers were of American nationality. 1 father and 1 mother of other.

In DONIPHAN county, the total number of births returned is 33. Of these, 1 was a male, 2 females; all were white; all were the third child of mothers; there was 1 pair of twins; all were born in towns of less than 500 population, and in the country; 1 mother was between 26 and 30 years of age, 1 mother between 31 and 35, 1 father between 36 and 40, 1 father between 41 and 45; all were of American nationality.

In ELLIS county, the total number of births returned is 47. Of these, 21 were males, and 26 females; all were white; 11 were the first child of mothers, 16 the second, 12 the third, 5 the fourth, 2 the fifth, 1 the sixth; 2 fathers and 15 mothers were under 20 years of age, 13 fathers and 22 mothers between 21 and 25, 19 fathers and 5 mothers between 26 and 30, 5 fathers and 3 mothers between 31 and 35, 3 fathers and 2 mothers between 36 and 40, 2 fathers between 41 and 45, 2 fathers between 46 and 50, 1 father between 51 and 55; 13 fathers and 15 mothers were of American nationality, 1 father of British North-American, 5 fathers and 7 mothers of English, 10 fathers and 3 mothers of Irish, 2 fathers and 2 mothers of Scotch, 14 fathers and 20 mothers of German. 1 father and 1 mother of Scandinavian. 1 father of Austrian.

In ELLSWORTH county, the number of births returned is 88. Of these, 51 were males, 35 females, the sex of two not stated; 86 were white, and 2 colored; 24 were the first child of mothers, 19 the second, 17 the third, 6 the fourth, 7 the fifth, 4 the sixth, 5 the seventh, 4 the eighth, 3 the ninth; 47 were born in cities and towns of 500 to 5,000 population, 41 in towns of less than 500 population, and in the country; 1 father and 12 mothers were under 20 years of age, 11 fathers and 27 mothers between 21 and 25, 30 fathers and 22 mothers between 26 and 30, 16 fathers and 8 mothers between 31 and 35, 9 fathers and 15 mothers between 36 and 40, 14 fathers and 3 mothers between 41 and 45, 5 fathers between 46 and 50, 1 father between 51 and 55, 1 father and 1 mother not given; 56 fathers and 62 mothers were of American nationality, 2 fathers of British North-American, 3 fathers of English, 9 fathers and 9 mothers of Irish, 10 fathers and 10 mothers of German, 3 fathers and 1 mother of Scandinavian, 4 fathers and 5 mothers of Austrian, 1 father of Swiss, 1 mother of French.

In FINNEY county, the total number of births returned is 55. Of these, 30 were males, 23 females, 2 not given; all were white; 22 were the first child of mothers, 9 the second, 9 the third, 4 the fourth, 3 the fifth, 3 the sixth, 2 the seventh, 2 the eighth, 1 the eleventh and more, 3 not given; 37 were born in cities and towns of 500 to 5,000 population, 2 in towns of less than 500 population, and in the country: 2

mothers were between 21 and 25 years of age, 2 fathers and 8 mothers between 26 and 30, 6 fathers and 3 mothers between 31 and 35, 5 fathers and 3 mothers between 36 and 40, 2 fathers and 1 mother between 41 and 45, 1 father between 46 and 50, 35 fathers and 36 mothers not given; 48 fathers and 49 mothers were of American nationality, 3 fathers and 3 mothers of Irish, 2 fathers and 1 mother of German, 1 father and 2 mothers of French, 1 father of other; there were 2 pairs of twins.

In FRANKLIN county, the total number of births returned is 45. Of these, 22 were males, 23 females; all were white; 6 were the first child of mothers, 11 the second, 5 the third, 4 the fourth, 5 the fifth, 6 the sixth, 3 the seventh, 2 the eighth, 2 the ninth, 1 not given; there was one still-birth; all were born in cities and towns of 500 to 5,000 population; 3 mothers were under 20 years of age; 3 fathers and 13 mothers between 21 and 25, 11 fathers and 10 mothers between 26 and 30, 10 fathers and 8 mothers between 31 and 35, 10 fathers and 8 mothers between 36 and 40, 3 fathers and 1 mother between 41 and 45, 4 fathers between 46 and 50, 1 father between 51 and 55, 2 fathers and 2 mothers not given; 40 fathers and 42 mothers were of American nationality, 1 father of English, 1 father and 1 mother of Irish, 1 father and 1 mother of German, 1 father of Austrian, 1 father and 1 mother not given.

In GARFIELD county, the total number of births returned is 18. Of these, 9 were males, 8 females, 1 not stated; all were white; 5 were the first child of mothers, 4 the second, 4 the third, 1 the fifth, 1 the sixth, 1 the seventh, 2 not given; all were born in towns of less than 500 inhabitants, and in the country; there was 1 still-birth; 2 mothers were under 20 years of age, 3 between 21 and 25, 4 fathers and 3 mothers between 26 and 30, 2 fathers and 2 mothers between 31 and 35, 2 fathers and 2 mothers between 36 and 40, 3 fathers between 41 and 45, 7 fathers and 6 mothers not given; 17 fathers and 17 mothers were of American nationality, 1 father and 1 mother of Irish.

In GEARY county, the total number of births returned is 126. Of these, 49 were males, 83 females; 119 were white, 13 colored; 35 were the first child of mothers, 24 the second, 20 the third, 13 the fourth, 8 the fifth, 8 the sixth, 5 the seventh, 6 the eighth, 3 the ninth, 1 the tenth, 3 the eleventh, 2 not given; 14 fathers were between 21 and 26 years of age, 35 between 26 and 30, 27 between 31 and 35, 29 between 36 and 40, 12 between 41 and 45, 4 between 46 and 50, 3 between 51 and 55, 1 over 55, 1 not given; 15 mothers were between 16 and 20, 36 between 21 and 25, 34 between 26 and 30, 14 between 31 and 35, 17 between 36 and 40, 4 between 41 and 45, 1 over 45, 4 not given; 82 fathers and 89 mothers were of American nationality, 3 fathers and 2 mothers of British North-American, 6 fathers and 2 mothers of English, 4 fathers and 2 mothers of Irish, 19 fathers and 15 mothers of German, 12 fathers and 15 mothers of Scandinavian; there were 4 pairs of twins, 3 triplets.

In GREELEY county, the total number of births returned is 29. Of these, 15 were males, 14 females; all were white; 12 were the first child of mothers, 5 the second, 2 the third, 2 the fourth, 4 the fifth, 2 the sixth, 1 the seventh, 1 the eleventh and more; all were born in towns of less than 500 population, and in the country; 2 mothers were under 20 years of age, 1 father and 6 mothers between 21 and 25, 6 fathers and 10 mothers between 26 and 30, 13 fathers and 4 mothers between 31 and 35, 3 fathers and 5 mothers between 36 and 40, 4 fathers and 1 mother between 41 and 45; 23 fathers and 28 mothers were of American nationality, 2 fathers of Scotch, 1 of German, 1 father of Scandinavian. There was 1 pair of twins, 1 illegitimate child, 1 still-birth.

In GREENWOOD county, the total number of births returned is 74. Of these, 38 were males, 36 females; 73 were white, and 1 colored; 20 were the first child of mothers, 15 the second, 9 the third, 9 the fourth, 5 the fifth, 5 the sixth, 3 the seventh, 2 the ninth, 2 the tenth, 1 eleventh and more, and 3 not given; 12 mothers were under 20 years of age, 12 fathers and 16 mothers between 21 and 25, 17 fathers and 24 mothers between 26 and 30, 14 fathers and 11 mothers between 31 and 35, 15 fathers and 7 mothers between 36 and 40, 5 fathers and 11 mothers between 41 and 45, 2 fathers between 51 and 55; 70 fathers and 68 mothers were of American nationality, 1 father of British North-American, 2 fathers of Scandinavian, 1 father of Dutch, 2 mothers of Irish, 2 mothers of German. There were 4 still-births.

In HARVEY county, the total number of births returned is 28. Of these, 10 were males, 18 females; all were white; 8 were the first child of mothers, 9 the second, 2 the third, 2 the fourth, 5 the seventh, 1 the eighth, 1 the tenth; all were born in towns or villages under 500 population, and in the country; 1 mother was under 20 years of age, 8 mothers and 6 fathers between 21 and 25, 13 mothers and 11 fathers between 26 and 30, 3 mothers and 2 fathers between 31 and 35, 3 mothers and 5 fathers between 36 and 40, 2 mothers and 1 father between 41 and 45; 9 fathers and 10 mothers were of American nationality, 1 father of Irish, 18 fathers and 18 mothers of German.

In HODGEMAN county, the total number of births returned is 27. Of these, 11 were males, and 17 females; 24 were white, and 2 colored; 8 were the first child of mothers, 9 the second, 1 the third, 4 the fourth, 1 the fifth, 2 the sixth, 1 the eighth, 1 the ninth; there were 2 pairs of twins; all were born in towns of less than 500 population, and in the country; 2 fathers and 3 mothers were under 20 years of age, 2 fathers and 7 mothers between 21 and 25, 5 fathers and 6 mothers between 26 and 30, 6 fathers and 2 mothers between 31 and 35, 2 fathers between 36 and 40, 4 fathers and 1 mother between 41 and 45, 1 father between 46 and 50, 4 fathers and 6 mothers not given; all were of American nationality.

In JACKSON county, the total number of births returned is 15. Of these, 8 were males, 5 females, 2 not given; all were white; 5 were the first child of mothers, 3 the second, 4 the fourth, 1 the sixth, 2 the seventh: all were born in cities and towns of 500 to 5,000 population; 4 mothers were under 20 years of age, 3 fathers and 2 mothers were between 21 and 25, 4 fathers and 2 mothers between 26 and 30, 3 fathers and 3 mothers between 31 and 35, 3 fathers and 4 mothers between 36 and 40, 1 father between 41 and 45, 1 father between 46 and 50; 8 fathers and 10 mothers were of American nationality, 1 father of Scotch, 6 fathers and 5 mothers of others.

In JEFFERSON county, the total number of births returned is 9. Of these, 5 were males, 4 females; all were white; 4 were the second child of mothers, 1 the fifth, 1 the sixth, 1 the seventh, 1 the eleventh and more, 1 not given; all were born in towns of less than 500 population, and in the country: 1 mother was between 21 and 25 years of age, 2 fathers between 26 and 30, 1 father and 5 mothers between 31 and 35, 2 mothers between 36 and 40, 4 fathers between 41 and 45, 1 father between 51 and 55, 1 father and 1 mother not given; 2 fathers and 2 mothers were of American nationality, 1 father and 1 mother of Irish, 1 mother of Dutch, 6 fathers and 5 mothers not given. There was 1 still-birth.

In JEWELL county, the total number of births returned is 58. Of these, 29 were males, 28 females, 1 not given; all were white; 12 were the first child of mothers, 8

the second, 13 the third, 7 the fourth, 6 the fifth, 2 the sixth, 1 the seventh, 2 the eighth, 4 the tenth, 3 the eleventh and more, 1 not given; 8 mothers were under 20 years of age, 7 fathers and 16 mothers between 20 and 25, 11 fathers and 15 mothers between 26 and 30, 17 fathers and 5 mothers between 31 and 35, 12 fathers and 7 mothers between 36 and 40, 6 fathers and 5 mothers between 41 and 45, 1 father and 1 mother not given; 51 fathers and 54 mothers were of American nationality, 4 mothers and 6 fathers of German: there were 2 pairs of twins.

In JOHNSON county, the total number of births returned is 118. Of these, 61 were males, and 52 females; 105 were white, and eight colored; 30 were the first child of mothers, 21 the second, 17 the third, 15 the fourth, 8 the fifth, 4 the sixth, 4 the seventh, 6 the eighth, 1 the ninth, 3 the tenth, 3 the eleventh, 1 not given; 56 were born in cities and towns of 500 to 5,000 population, and 57 were born in towns of less than 500 population, and in the country; 1 father and 20 mothers were between 16 and 20 years of age, 17 fathers and 27 mothers between 21 and 25, 29 fathers and 27 mothers between 26 and 30, 27 fathers and 17 mothers between 31 and 35, 23 fathers and 16 mothers between 36 and 40, 7 fathers and five mothers between 41 and 45, 5 fathers between 46 and 50, 3 fathers between 51 and 55, 1 father and 1 mother not given; 104 fathers and 109 mothers were of American nationality, 1 father and 1 mother of English, 2 fathers of Irish, 5 fathers and 2 mothers of German, 1 mother of Swiss. The nationality of 1 father not given. There were 2 pairs of twins, 1 illegitimate child, 10 still-births.

In KEARNY county, the total number of births returned is 22. Of these, 13 were males, and 9 females; 6 were the first child of mothers, 4 the second, 4 the third, 3 the fourth, 3 the fifth, 1 the sixth; 3 mothers were under 20 years of age, 11 fathers and 9 mothers between 21 and 25, 13 fathers and 4 mothers between 26 and 30, 3 fathers and 4 mothers between 31 and 35, 2 fathers between 36 and 40, 3 fathers and 2 mothers between 41 and 45; 20 fathers and 21 mothers were of American nationality, 2 fathers and 2 mothers of English.

In KINGMAN county, the total number of births returned is 137. Of these, 56 were males, 83 females; 135 were white, 2 colored; 37 were the first child of mothers, 31 the second, 10 the third, 21 the fourth, 7 the fifth, 6 the sixth, 6 the seventh, 1 the eighth, 3 the ninth, 2 the tenth, 2 the eleventh and more, 11 not given; there were 2 twins; 68 were born in cities and towns of 500 to 5,000 population, 71 in towns of less than 500 population, and in the country; 26 mothers were under 20 years of age, 12 fathers and 43 mothers between 21 and 25, 41 fathers and 27 mothers between 26 and 30, 36 fathers and 24 mothers between 31 and 35, 31 fathers and 14 mothers between 36 and 40, 12 fathers and 2 mothers between 41 and 45, 3 fathers between 46 and 50, 1 father between 51 and 55; 130 fathers and 131 mothers were of American nationality, 1 father and 1 mother of British North-American, 4 fathers and 4 mothers of German, 2 fathers and 1 mother not given.

In LABETTE county, the total number of births returned is 78. Of these, 46 were males, 31 females, 1 not given; 74 were white, 4 colored; 17 were the first child of mothers, 10 the second, 10 the third, 10 the fourth, 7 the fifth, 6 the sixth, 4 the seventh, 7 the eighth, 2 the ninth, 2 the tenth, 1 the eleventh and more, 2 not given; 2 were born in cities and towns of 5,000 (or over) population, 22 in cities and towns of 500 to 5,000 population, 54 in towns of less than 500 population, and in the country; 1 illegitimate child; 9 mothers were under 20 years of age, 9 fathers and 13 mothers between 21 and 25, 12 fathers and 15 mothers between 26 and 30, 19

fathers and 16 mothers between 31 and 35, 13 fathers and 15 mothers between 36 and 40, 11 fathers and 5 mothers between 41 and 45, 6 fathers between 48 and 50, 2 fathers between 51 and 55, 5 fathers and 5 mothers not given; 73 fathers and 77 mothers were of American nationality, 1 father and 1 mother of English, 2 fathers of Irish, 1 father of German.

In LANE county, the total number of births returned is 28. Of these, 13 were males, and 15 were females; all were white; 3 were the first child of mothers, 8 the second, 6 the third, 4 the fourth, 2 the fifth, 3 the seventh, 1 the ninth, 1 the tenth; all were born in towns of less than 500 population, and in the country; 2 mothers were between 16 and 20 years of age, 1 father and 8 mothers between 21 and 25, 12 fathers and 5 mothers between 26 and 30, 5 fathers and 7 mothers between 31 and 35; 4 fathers and 3 mothers between 36 and 40, 3 fathers and 1 mother between 41 and 45, 2 fathers and 1 mother over 45, 1 mother not given; 24 fathers and 25 mothers were of American nationality, 3 fathers and 3 mothers of German, 1 father of Scandinavian; 1 pair of twins.

In LEAVENWORTH county, the total number of births returned is 8. Of these, 5 were males, 3 females; 5 were white, 3 colored; 1 was the first child of mother, 3 the second, 2 the third, 2 the fourth; all were born in cities and towns of 5,000 or over population; 1 mother was under 20 years of age, 2 fathers and 7 mothers between 21 and 25, 3 fathers between 26 and 30, 1 father between 31 and 35, 1 father between 36 and 40, 1 father between 41 and 45; 4 fathers and 4 mothers were of American nationality, 1 father and 1 mother of Irish, 3 fathers and 3 mothers of Polish.

In LYON county, the total number of births returned is 40. Of these, 19 were males 21 females; all were white; 6 were the first child of mothers, 11 the second, 7 the third, 9 the fourth, 3 the fifth, 1 the sixth, 1 the eighth, 1 the ninth, 1 the tenth; 13 were born in cities and towns of 500 to 5,000 population, 27 in towns of less than 500 population, and in the country; 4 mothers were under 20 years of age, 8 fathers and 14 mothers between 21 and 25, 8 fathers and 10 mothers between 26 and 30, 12 fathers and 7 mothers between 31 and 35, 4 fathers and 4 mothers between 36 and 40, 5 fathers and 1 mother between 41 and 45, 3 fathers between 46 and 50; 37 fathers and 36 mothers were of American nationality, 1 father of English, 1 mother of Scotch, 2 fathers and 3 mothers of Scandinavian.

In MARION county, the total number of births returned is 248. Of these, 130 were males, 116 females, 2 not given; 247 were white, 1 colored; 41 were the first child of mothers, 50 the second, 39 the third, 29 the fourth, 19 the fifth, 19 the sixth, 14 the seventh, 11 the eighth, 8 the ninth, 4 the tenth, 4 the eleventh and more, 10 not given; all were born in cities and towns of 500 to 5,000 population; 3 fathers and 29 mothers were under 20 years of age, 37 fathers and 68 mothers between 21 and 25, 64 fathers and 53 mothers between 26 and 30, 54 fathers and 49 mothers between 31 and 35, 42 fathers and 31 mothers between 36 and 40, 22 fathers and 6 mothers between 41 and 45, 11 fathers and 3 mothers between 46 and 50, 2 fathers between 51 and 55, 3 fathers over 55, 10 fathers and 11 mothers not given; 73 fathers and 77 mothers were of American nationality, 1 mother and 3 fathers of British North-American, 3 fathers and 2 mothers of English, 158 fathers and 154 mothers of German, 1 father and 1 mother of Polish, 11 fathers and 11 mothers not given. There were 8 still-births.

In McPHERSON county, the total number of births returned is 133. Of these, 67 were males and 65 females, the sex of one not given; all were white; 32 were the

first child of mothers, 30 the second, 21 the third, 23 the fourth, 10 the fifth, 6 the sixth, 5 the seventh, 3 the eighth, 3 the ninth; there were 5 twins; 25 were born in cities and towns of 5,000 or over population, 34 in cities and towns of 500 to 5,000 population, 59 in towns of less than 500 population, and in the country; 13 mothers were under 20 years of age, 12 fathers and 25 mothers between 21 and 25, 21 fathers and 24 mothers between 26 and 30, 29 fathers and 25 mothers between 31 and 35, 13 fathers and 11 mothers between 36 and 40, 16 fathers and 4 mothers between 41 and 45, 4 fathers between 46 and 50, 4 fathers between 51 and 55, 34 fathers and 31 mothers not given; 74 fathers and 75 mothers were of American nationality, 2 fathers and 2 mothers of English, 1 father of Irish, 1 father of Scotch, 4 fathers and 4 mothers of German, 33 fathers and 34 mothers of Scandinavian, 2 mothers of Dutch, 1 mother of Italian, 1 mother of Belgian, 4 fathers of other, 14 fathers and 14 mothers not given; 1 pair of twins.

In MEADE county, the total number of births returned is 8. Of these, 3 were males, 5 were females, all were white; 1 was the first child of mother, 1 the second, 2 the third, 2 the fourth, 1 the fifth, 1 the seventh; there was 1 twin, and 1 illegitimate child; 1 mother was under 20 years of age, 1 mother between 21 and 25, 3 mothers between 25 and 30, 1 mother and 4 fathers between 31 and 35, 1 father and 1 mother between 36 and 40, 1 father between 41 and 45, 1 father not given; 6 fathers and 6 mothers were of American nationality, 1 father of German, 1 mother of Scotch.

In MIAMI county, the total number of births returned is 43. Of these, 18 were males, 25 females; 35 were white, 1 colored; 14 were the first child of mothers, 12 the second, 6 the third, 3 the fourth, 6 the fifth, 1 the sixth, 1 the seventh, 1 the eighth, 1 the ninth, 1 the tenth; there was 1 illegitimate child and 1 still-birth; 3 mothers were under 20 years of age, 2 fathers and 13 mothers between 21 and 25, 15 fathers and 11 mothers between 26 and 30, 9 fathers and 2 mothers between 31 and 35, 5 fathers and 4 mothers between 36 and 40, 2 fathers between 41 and 45, 4 fathers between 46 and 50, 2 fathers between 51 and 55; 35 fathers and 37 mothers were of American nationality, 2 fathers and 1 mother of English, 1 father of Irish, 3 fathers and 1 mother of German, 2 fathers and 2 mothers of other.

In Montgomery county, the total number of births returned is 177. Of these, 77 were males, 93 females, 7 not reported; 176 were white, 2 colored; 40 were the first child of mothers, 32 the second, 28 the third, 16 the fourth, 19 the fifth, 6 the sixth, 5 the seventh, 19 the eighth, 3 the ninth, 2 the tenth, 4 the eleventh and more, 12 not given; there were 1 twin and 4 still-births; 37 were born in cities and towns of 5,000 or over, 68 in cities and towns of 500 to 5,000 population, 62 in towns of less than 500 population, and in the country; 1 father and 16 mothers were under 20 years of age, 26 fathers and 55 mothers between 21 and 25, 39 fathers and 37 mothers between 26 and 30, 31 fathers and 28 mothers between 31 and 35, 27 fathers and 19 mothers between 36 and 40, 23 fathers and 8 mothers between 41 and 45, 8 fathers between 46 and 50, 1 father between 51 and 55, 5 fathers over 55, 15 fathers and 14 mothers not given; 147 fathers and 156 mothers were of American nationality, 4 fathers and 4 mothers of English, 5 fathers and 3 mothers of Irish, 1 father and 1 mother of Scotch, 11 fathers and 9 mothers of German, 1 father of French, 4 fathers and 4 mothers not given.

In NEMAH county, total births, 169. Of these, 79 were males, and 90 females; 168 were white, and 1 colored; 49 were the first child of mothers, 31 the second, 27

the third, 20 the fourth, 11 the fifth, 9 the sixth, 4 the seventh, 8 the eighth, 2 the ninth, 3 the tenth, 4 the eleventh, and 1 the fourteenth; there were 2 twins; 44 were born in cities and towns of 500 to 5,000 population, and 125 in towns of less than 500 population, and in the country; 20 mothers were between 16 and 20 years of age, 21 fathers and 44 mothers were between 21 and 25, 50 fathers and 35 mothers between 26 and 30, 31 fathers and 28 mothers between 31 and 35, 24 fathers and 19 mothers between 36 and 40, 14 fathers and 5 mothers between 41 and 45, 4 fathers between 46 and 50, 4 fathers between 51 and 55, and 16 fathers and 17 mothers, age not given; 141 fathers and 153 mothers were of American nationality, 11 fathers and 8 mothers of German, 4 fathers and 1 mother of Scotch, 6 fathers of Irish, 1 father and 1 mother of British North-American, 1 father and 1 mother of Swiss, 1 father and 2 mothers of English, 1 father and 2 mothers of Welch, 1 father of Swedish, and 1 father of Austrian.

In NESS county, the total number of births returned is 33. Of these, 17 were males, 16 females; all were white; 9 were the first child of mothers, 3 the second, 4 the third, 2 the fourth, 1 the fifth, 3 the sixth, 2 the seventh, 2 the eighth, 1 the ninth, 6 not given; all were born in towns of less than 500 population, and in the country; 1 mother was under 15 years of age, 4 mothers between 16 and 20, 7 fathers and 5 mothers between 21 and 25, 5 fathers and 7 mothers between 26 and 30, 8 fathers and 6 mothers between 31 and 35, 4 fathers and 2 mothers between 36 and 40, 3 fathers between 41 and 45, 1 father between 46 and 50, 4 fathers and 5 mothers not given; 23 fathers and 25 mothers were of American nationality, 5 fathers and 4 mothers of German, 2 fathers of Austrian, 1 father of Swiss, 1 mother of French. 1 mother of Swiss; there were 2 pairs of twins.

In OSAGE county, the total number of births is 132. Of these, 76 were males, 55 females, and the sex of one not given; 122 were white, 10 colored; 32 were the first child of mothers, 29 the second, 14 the third, 18 the fourth, 8 the fifth, 10 the sixth, 8 the seventh, 3 the eighth, 3 the ninth, 3 the tenth, 1 the eleventh or more, 3 were not given; there were 2 twins and 1 still-birth; 86 were born in cities and towns of 500 to 5,000 population, 46 in towns of less than 500 population, and in the country; 24 mothers were under 20 years of age, 26 fathers and 35 mothers between 21 and 25, 28 fathers and 35 mothers between 26 and 30, 35 fathers and 24 mothers between 31 and 35, 19 fathers and 9 mothers between 36 and 40, 4 fathers and 1 mother between 41 and 45; 4 fathers between 46 and 50, 3 fathers between 51 and 55, 3 fathers over 55, 3 fathers and two mothers not given; 97 fathers and 103 mothers were of American nationality, 1 father of British North-American, 7 fathers and 4 mothers of English, 1 father of Irish, 8 fathers and 7 mothers of Scotch, 2 fathers and 4 mothers of German, 7 fathers and 7 mothers of Scandinavian, 1 father of Austrian, 1 father and 1 mother of French, 2 fathers and 1 mother of Italian, 3 mothers not given.

In OSBORNE county, the total number of births returned is 136. Of these, 66 were males, 67 females, and 3 were not given; 135 were white, 1 colored; 28 were the first child of mothers, 25 the second, 22 the third, 11 the fourth, 20 the fifth, 13 the sixth, 3 the seventh, 5 the eighth, 5 the ninth, 3 the tenth, 1 the eleventh and more; there were 1 pair of twins, 1 illegitimate child, 7 still-births; 51 were born in cities and towns of 500 to 5,000 population, 83 in towns of less than 500 population, and in the country, 2 were not given; 13 mothers were under 20 years of age, 13 fathers and 40 mothers between 21 and 25, 36 fathers and 30 mothers between 26 and 30; 31 fathers and 20 mothers between 31 and 35, 17 fathers and 16 mothers between 36 and 40, 18 fathers and 4 mothers between 46 and 50, 1 father between 51 and 55, 15 fathers and

13 mothers not given; 124 fathers and 129 mothers were of American nationality, 2 fathers and 2 mothers were of British North-American, 1 father of Danish, 1 mother of Irish, 5 fathers and 3 mothers of German, 1 father of French, 2 fathers and 2 mothers not given.

In PHILLIPS county, the total number of births returned is 49. Of these, 25 were males, 24 females; 47 were white, 2 colored; 18 were the first child of mothers, 10 the second, 5 the third, 3 the fourth, 7 the fifth, 1 the sixth, 2 the seventh, 1 the eighth, 2 the ninth; there was 1 illegitimate child, 1 still-birth; 12 were born in cities and towns of 500 to 5,000 of population, 37 in towns of less than 500 population, and in the country; 1 father and 16 mothers were under 20 years of age, 11 fathers and 11 mothers between 21 and 25, 17 fathers and 11 mothers between 26 and 30, 5 fathers and 5 mothers between 31 and 35, 5 fathers and 5 mothers between 36 and 40, 2 fathers and 1 mother between 41 and 45; 48 fathers and 47 mothers were of American nationality, 1 father and 2 mothers of Dutch.

In POTTAWATOMIE county, the total number of births returned is 128. Of these, 64 are males, and 64 females; all were white; 38 were the first child of mothers, 28 the second, 18 the third, 21 the fourth, 6 the fifth, 7 the sixth, 5 the seventh, 1 the eighth, 1 the ninth, 1 the tenth, 2 not given; 64 were born in cities and towns of 500 to 5,000 population, 64 in towns of less than 500 population, and in the country; 1 father and 20 mothers were under 20 years of age, 17 fathers and 37 mothers were between 21 and 25, 37 fathers and 26 mothers between 26 and 30, 29 fathers and 17 mothers between 31 and 35, 20 fathers and 14 mothers between 36 and 40, 9 fathers and three mothers between 41 and 45, 6 fathers between 46 and 50, 9 fathers and 11 mothers not given; 94 fathers and 105 mothers were of American nationality, 1 father of British North-American, 4 fathers and 4 mothers of Irish, 11 fathers and 12 mothers of German, 3 fathers and 1 mother of English, 8 fathers and mothers of French, 1 father of Dutch, 2 fathers of other, 1 father and 1 mother not given.

In RAWLINS county, the total number of births returned is 31. Of these, 13 were males, and 17 females, and 1 not given; all were white; 8 were the first child of mothers, 9 the second, 3 the third, 3 the fourth, 3 the fifth, 1 the sixth, 1 the seventh, 2 the ninth, 1 the tenth; all were born in towns of less than 500 population, and in the country; 2 mothers were under 20 years of age, 3 fathers and 12 mothers were between 21 and 25, 10 fathers and 8 mothers were between 26 and 30, 9 fathers and 4 mothers between 31 and 35, 4 fathers and 3 mothers between 36 and 40, 3 fathers and 2 mothers between 41 and 45, 2 fathers between 46 and 50; 25 fathers and 27 mothers were of American nationality, 1 father of English, 1 father of Irish, 1 father of Scotch, 1 father and 2 mothers of German, 1 father and 1 mother of Scandinavian, 1 father and 1 mother of Austrian.

In REPUBLIC county, the total number of births returned is 3. Of these, 2 were males, 1 was a female; all were white; 1 was the second child of mother, 1 the eighth, 1 the ninth; all were born in towns of less than 500 population, and in the country; 1 father and 1 mother were between 21 and 25 years of age, 1 mother between 31 and 35, 1 father and 1 mother between 36 and 40, 1 father between 41 and 45; all were of American nationality.

In SHAWNEE county, the total number of births returned is 231. Of these, 112 are males and 118 females, and 1 not given; 202 were white and 29 were colored; 75 were the first child of mothers, 29 the second, 40 the third, 31 the fourth, 7 the fifth, 15 the

sixth, 13 the seventh, 4 the eighth, 1 the ninth, 1 the tenth, 4 the eleventh and more, and 1 not given; 173 were born in cities and towns of 5,000 or over population, 12 in cities and towns of 500 to 5,000 population, 46 in towns of less than 500 population, and in the country; 3 fathers and 49 mothers were under 20 years of age, 48 fathers and 56 mothers were between 21 and 25, 68 fathers and 56 mothers between 26 and 30, 36 fathers and 38 mothers between 31 and 35, 34 fathers and 24 mothers between 36 and 40, 22 fathers and 3 mothers between 41 and 45, 8 fathers between 46 and 50, 6 fathers between 51 and 55, 3 fathers over 55, 3 fathers and 5 mothers' ages were not given; 170 fathers and 187 mothers were of American nationality, 3 fathers and 3 mothers of British North-American, 9 fathers and 5 mothers of English, 3 fathers and 2 mothers of Irish, 2 fathers and 1 mother of Scotch, 18 fathers and 5 mothers of German, 21 fathers and 22 mothers of Scandinavian, 1 mother of Austrian, 1 mother of Polish, 1 father of Dutch, 1 father of Belgian, 3 fathers' and 4 mothers' nationalities not given; 1 pair of twins.

In SHERIDAN county, the total number of births returned is 29. Of these, 17 were males, 12 females; all were white; 4 were the first child of mothers, 11 the second, 8 the third, 3 the fourth, 2 the sixth, 1 the ninth; 21 were born in towns of less than 500 inhabitants, and in the country; 2 mothers were between 16 and 20 years of age, 3 fathers and 10 mothers between 21 and 25, 12 fathers and 8 mothers between 26 and 30, 7 fathers and 5 mothers between 31 and 35, 2 fathers between 36 and 40, 3 fathers and 2 mothers between 41 and 45; 21 fathers and 24 mothers were of American nationality, 1 father and 1 mother of Irish, 1 father and 1 mother of German, 1 father and 1 mother of Scandinavian. There were 2 pairs of twins.

In SHERMAN county, the total number of births returned is 67. Of these, 34 were males, 33 females; 66 were white, 1 colored; 25 were the first child of mothers, 12 the second, 8 the third, 8 the fourth, 4 the fifth, 3 the sixth, 1 the seventh, 1 the eighth, 2 the tenth, 2 not given; all were born in towns of less than 500 population, and in the country; 5 mothers were under 20 years of age, 3 fathers and 29 mothers were between 21 and 25, 33 fathers and 15 mothers between 26 and 30, 12 fathers and 7 mothers between 31 and 35, 8 fathers and 6 mothers between 36 and 40, 2 fathers and 2 mothers between 46 and 50, the ages of 4 fathers and 4 mothers not given; 64 fathers and 65 mothers were of American nationality, 3 fathers and 3 mothers of German. There were 2 twins, 1 triplet, 1 still-birth.

In STANTON county, the total number of births returned is 18. Of these, 12 were males, 4 females, 2 not given; all white; 4 were the first child of mothers, 5 the second, 1 the third, 6 the fourth, 1 the sixth, 1 the seventh; all were born in towns of less than 500 population, and in the country; 4 mothers were under 20 years of age, 1 father and 1 mother between 26 and 30, 9 fathers between 31 and 35, 8 fathers and 13 mothers, ages not given; 5 fathers and 5 mothers were of American nationality, 13 fathers and 13 mothers not given.

In THOMAS county, the total number of births returned is 79. Of these, 49 were males, and 30 females; all were white; 24 were the first child of mothers, 18 the second, 12 the third, 9 the fourth, 4 the fifth, 4 the sixth, 4 the seventh, 1 the eighth, 2 the ninth, 1 the tenth; 18 were born in cities and towns of 500 to 5,000 population, 61 in towns of less than 500 population, and in the country; 2 fathers and 17 mothers

were under 20 years of age, 6 fathers and 20 mothers between 21 and 25, 22 fathers and 17 mothers between 26 and 30, 25 fathers and 15 mothers between 31 and 35, 17 fathers and 6 mothers between 36 and 40, 4 fathers and 3 mothers between 41 and 45, 2 fathers between 46 and 50; 69 fathers and 72 mothers were of American nationality, 1 father of Irish, 1 father and 1 mother of Scotch, 3 fathers and 3 mothers of German, 1 father and 1 mother of Scandinavian, 1 father and 1 mother of Austrian: 1 pair twins and 7 still-births.

In WABAUNSEE county, the total number of births returned is 196. Of these, 102 were males, 94 females; 185 were white, 11 colored; 57 were the first child of mothers, 40 the second, 23 the third, 20 the fourth, 22 the fifth, 8 the sixth, 8 the seventh, 5 the eighth, 5 the ninth, 1 the tenth, 5 the eleventh and more, 2 not given; 64 were born in towns and cities of 500 to 5,000 population, 132 in towns of less than 500 population, and 1 in the country; 1 mother was under 15 years of age, 2 fathers and 39 mothers between 16 and 30, 27 fathers and 39 mothers between 21 and 25, 50 fathers and 49 mothers between 26 and 30, 37 fathers and 38 mothers between 31 and 35, 33 fathers and 30 mothers between 36 and 40, 24 fathers and 28 mothers between 41 and 45, 12 fathers and 4 mothers between 46 and 50, 4 fathers and 3 mothers between 51 and 55, 1 father over 55, 6 fathers and 4 mothers not given; 150 fathers and 167 mothers were of American nationality, 3 fathers and 3 mothers of British North-American, 2 fathers of English, 1 father and 1 mother of Irish, 4 fathers and 1 mother of Scotch, 29 fathers and 19 mothers of German, 4 fathers and 3 mothers of Scandinavian, 1 father and 1 mother of Austrian, 1 father and 1 mother of Swiss. There were 2 pairs of twins, and 4 still-births.

In WILSON county, the total number of births returned is 71. Of these, 34 were males, 37 females; all were white; 12 were the first child of mothers, 16 the second, 9 the third, 13 the fourth, 6 the fifth, 5 the sixth, 2 the seventh, 4 the eighth, 2 the ninth, 1 the tenth, 1 the eleventh and more; 8 were born in cities and towns of 500 to 5,000 population, 63 in towns of less than 500 population, and in the country; 3 fathers and 8 mothers were under 20 years of age, 10 fathers and 25 mothers between 21 and 25, 19 fathers and 15 mothers between 26 and 30, 10 fathers and 9 mothers between 31 and 35, 14 fathers and 10 mothers between 36 and 40, 7 fathers and 3 mothers between 41 and 45, 3 fathers between 46 and 50, 2 fathers between 51 and 55, 1 father over 55, 2 fathers and 1 mother not given; 69 fathers and 71 mothers were of American nationality, 2 fathers of British North-American.

In WYANDOTTE county, the total number of births returned is 2. All were males; all were white; 1 was the first child of mother, 1 was the seventh; both were born in towns of less than 500 population, and in the country; 1 mother was under 20 years of age, 1 father between 21 and 25, 1 mother between 31 and 35, 1 father between 36 and 40; all were of American nationality.

DEATHS.

The following is a list of counties, and number of deaths in each, that were reported to the Secretary of the State Board of Health by the county health officers, physicians, and undertakers, for the years 1888, 1889, and 1890:

| <i>Counties.</i> | 1888. | 1889. | 1890. |
|-------------------|-------|-------|-------|
| Anderson..... | 10 | 40 | ..... |
| Atchison..... | 470 | 282 | 37 |
| Bourbon..... | ..... | 145 | ..... |
| Butler..... | ..... | 31 | 15 |
| Chase..... | 20 | 9 | ..... |
| Cheyenne..... | ..... | 13 | ..... |
| Clay..... | 207 | 147 | 123 |
| Cloud..... | 10 | ..... | ..... |
| Colley..... | 16 | ..... | 160 |
| Comanche..... | 10 | ..... | 6 |
| Crawford..... | 321 | 196 | 357 |
| Decatur..... | 27 | 11 | 12 |
| Doniphan..... | 32 | 18 | ..... |
| Elk..... | 37 | ..... | ..... |
| Ellis..... | 11 | 9 | ..... |
| Ellsworth..... | 89 | 74 | 73 |
| Finney..... | 32 | 22 | 27 |
| Ford..... | 84 | 59 | 35 |
| Franklin..... | 33 | 33 | 27 |
| Garfield..... | 4 | 5 | 3 |
| Geary..... | 109 | 122 | 92 |
| Gove..... | ..... | 1 | ..... |
| Graham..... | 51 | 12 | ..... |
| Gray..... | 4 | 3 | 3 |
| Greenwood..... | 129 | ..... | 49 |
| Greeley..... | ..... | 19 | 13 |
| Harvey..... | 40 | ..... | 95 |
| Hodgeman..... | 17 | 16 | 8 |
| Jackson..... | 5 | 2 | ..... |
| Jefferson..... | 24 | 3 | 2 |
| Jewell..... | 132 | 89 | 103 |
| Johnson..... | 124 | 68 | 54 |
| Kearny..... | ..... | 6 | 7 |
| Kingman..... | 62 | 39 | ..... |
| Kiowa..... | 1 | ..... | ..... |
| Labette..... | 170 | 80 | 73 |
| Lane..... | 6 | 18 | 28 |
| Leavenworth..... | 37 | 17 | 5 |
| Lincoln..... | 77 | 22 | ..... |
| Linn..... | 84 | 52 | ..... |
| Lyon..... | 71 | 6 | 19 |
| Marion..... | 39 | 84 | 122 |
| Marshall..... | 180 | 90 | ..... |
| McPherson..... | 101 | 176 | 34 |
| Miami..... | 114 | 161 | 49 |
| Meade..... | ..... | 8 | ..... |
| Montgomery..... | 73 | 40 | 46 |
| Nemaha..... | 60 | 57 | 34 |
| Neosho..... | 16 | 2 | ..... |
| Ness..... | ..... | 49 | 33 |
| Norton..... | 24 | 28 | ..... |
| Osage..... | 72 | 60 | 40 |
| Osborne..... | 79 | 96 | 87 |
| Pawnee..... | 23 | ..... | ..... |
| Phillips..... | 108 | 87 | 70 |
| Pottawatomie..... | 103 | 45 | 22 |
| Pratt..... | 26 | ..... | ..... |
| Rawlins..... | 27 | 20 | 20 |
| Russell..... | 36 | ..... | ..... |
| Saline..... | 39 | ..... | ..... |
| Scott..... | ..... | 13 | ..... |
| Sedgwick..... | 49 | 43 | ..... |
| Shawnee..... | 180 | 125 | 260 |
| Sheridan..... | 30 | ..... | 9 |
| Sherman..... | 25 | 28 | 40 |
| Stanton..... | ..... | 1 | 4 |
| Stevens..... | ..... | 6 | ..... |
| Thomas..... | 73 | 43 | 48 |
| Wabunsee..... | 111 | 105 | 87 |
| Washington..... | 31 | ..... | ..... |
| Wichita..... | 25 | 9 | ..... |
| Wilson..... | 93 | 53 | ..... |
| Woodson..... | 102 | 70 | 21 |
| Totals..... | 4,394 | 3,165 | 2,437 |

In ARCHISON county, the total number of deaths returned is 37. Of these, 22 were males, and 15 females; all were white; of their nativity, 31 were Americans, 4 German, and 2 Irish; 5 were under 1 year of age, 11 between 1 and 5, 3 between 5 and

10, 1 between 20 and 30, 3 between 40 and 50, 2 between 50 and 60, 5 between 60 and 70, 1 between 70 and 80; 2 died in the month of January, 8 in February, 7 in March, 14 in April, 3 in May, 1 in June, 1 in July. The number dying from contagious diseases is as follows: 2 males and 1 female from consumption, 2 males and 1 female from croup, 1 male and 2 females from measles.

In BUTLER county, the total number of deaths returned is 15. Of these, 8 were males, and 7 females; all were white; of their nationality, 8 were born in Kansas, and 7 in the United States; 9 were single, 4 married, 1 widow, 1 not stated; 3 were under 1 year of age, 3 between 1 and 5, 1 between 10 and 15, 1 between 20 and 30, 1 between 40 and 50, 3 between 50 and 60, 2 between 60 and 70; of the number, 2 died in the month of January, 2 in February, 1 in April, 1 in June, 1 in July, 2 in August, 2 in October. The number dying from contagious diseases is as follows: 1 male from scarlet fever, 1 male and 1 female from whooping-cough, 1 male from consumption.

In CLAY county, the total number of deaths returned is 123. Of these, 42 were males, 49 females, 32 not stated; 7 were white, 2 colored, 114 not stated; of their nativity, 5 were born in the United States, 2 were foreign-born, 116 not stated; 3 were single, 5 married, 115 not stated; 25 died in towns of under 5,000 and over 500 population, 98 in towns or villages under 500 population, or in the country; 26 were under 1 year of age, 11 between 1 and 5, 9 between 5 and 10, 5 between 10 and 15, 3 between 15 and 20, 18 between 20 and 30, 5 between 30 and 40, 7 between 40 and 50, 7 between 50 and 60, 13 between 60 and 70, 14 between 70 and 80, 3 between 80 and 90, 1 over 90, 1 not stated; of the number, 14 died in the month of January, 12 in February, 6 in March, 10 in April, 7 in May, 12 in June, 3 in July, 23 in September, 17 in October, 10 in November, 9 in December. The number dying from contagious diseases is as follows: 1 female from small-pox, 1 male from measles, 1 female from scarlet fever, 1 female from diphtheria, 1 male from whooping-cough, 1 female from enteric fever, 1 from cholera infantum, 1 male from consumption, 1 female from puerperal fever, 1 male from varioloid, 1 male from chicken-pox.

In COFFEY county, the total number of deaths returned is 117. Of these, 55 were males, 62 females; all were white; 21 were under 1 year of age, 20 were between 1 and 5, 7 between 5 and 10, 2 between 10 and 15, 8 between 15 and 20, 11 between 20 and 30, 4 between 30 and 40, 7 between 40 and 50, 4 between 50 and 60, 5 between 60 and 70, 10 between 70 and 80, 4 between 80 and 90. The number dying from contagious diseases is as follows: 7 from consumption, 6 from typhoid fever, 2 from diphtheria, 5 from croup, 5 from cholera infantum, 1 from whooping-cough, and 1 from scarlet fever.

In COMANCHE county, the total number of deaths returned is 6. Of these, 3 were males, 3 females; all were white; of their nativity, 2 were born in Kansas, 3 in the United States, 1 was foreign-born; 5 were single, 1 married; 2 died in towns under 5,000 and over 500 population, 4 in towns or villages under 500 population, or in the country; 2 were under 1 year of age, 3 between 5 and 10, 1 between 30 and 40; of the number, 2 died in the month of May, 1 in July, 1 in September, 2 in December.

In CRAWFORD county, the total number of deaths returned is 357. Of these, 143 were males, 151 females, 66 not stated; 43 were white, 1 colored, 314 not stated; 226 were single, 37 married, 98 not stated; 118 died in cities or towns over 5,000 population, 76 in towns under 5,000 and over 500 population, 163 in towns or villages under 500 population, or in the country; 100 were under 1 year of age, 93 between 1 and 5,

14 between 5 and 10, 9 between 10 and 15, 6 between 15 and 20, 17 between 20 and 30, 18 between 30 and 40, 20 between 40 and 50, 17 between 50 and 60, 19 between 60 and 70, 12 between 70 and 80, 4 between 80 and 90, 16 not stated; of the number, 33 died in the month of January, 19 in February, 29 in March, 20 in April, 57 in May, 29 in June, 40 in July, 47 in August, 9 in September, 33 in October, 23 in November, 14 in December. The number dying from contagious diseases is as follows: 5 males and 12 females from measles, 1 male and 3 females from scarlet fever, 6 males, 5 females and 5 not stated from diphtheria, 7 males, 5 females and 6 not stated from cholera infantum, 2 females from whooping-cough.

In DECATUR county, the total number of deaths returned is 12. Of these, 7 were males, 5 females; all were white; of their nativity, 4 were born in Kansas, 5 in the United States, and 3 were foreign-born; 6 were single, 3 married, 2 widows, 1 not stated; 3 died in towns under 5,000 and over 500 population, 9 in towns or villages under 500 population, or in the country; 2 were under 1 year of age, 2 between 1 and 5, 1 between 10 and 15, 1 between 15 and 20, 1 between 20 and 30, 1 between 30 and 40, 3 between 60 and 70, 1 not stated; of the number, 5 died in the month of January, 2 in February, 1 in August, 1 in September, 1 in November, 2 in December. The number dying from contagious diseases is as follows: 1 female from scarlet fever, 1 male from diphtheria, 1 female from consumption, 1 male from typhoid fever.

In ELLSWORTH county, the total number of deaths returned is 73. Of these, 41 were males, 28 females, the sex of 4 not stated: 71 were white, 1 colored, 1 not stated; of their nativity, 36 were born in Kansas, 28 in United States, 8 were foreign-born, and 1 not stated; 48 were single, 17 married, 2 widowers, 4 widows, 2 not stated; 15 died in towns under 5,000 and over 500 population, 58 in towns or villages under 500 population, or in the country; 14 were under 1 year of age, 18 between 1 and 5, 3 between 5 and 10, 7 between 10 and 15, 1 between 15 and 20, 9 between 20 and 30, 3 between 30 and 40, 3 between 40 and 50, 3 between 50 and 60, 3 between 60 and 70, 2 between 70 and 80, 4 between 80 and 90, 2 not stated; of the number, 5 died in the month of January, 7 in February, 16 in March, 2 in April, 9 in May, 3 in June, 6 in July, 3 in August, 8 in September, 6 in October, 5 in November, 3 in December. The number dying from contagious diseases is as follows: 6 males and 5 females and 1 not stated from measles, 2 females from whooping-cough, 3 males from enteric fever, 2 males and 3 females from consumption, 3 males and 1 not stated from croup, 1 male from cholera infantum.

In FINNEY county, the total number of deaths returned is 27. Of these, 16 were males, 10 females, 1 not stated; 24 were white, 3 colored; of their nativity, 4 were born in Kansas, 14 in the United States, 3 were foreign-born, 6 not stated; 12 were single, 11 married, 4 not stated; all died in cities and towns under 5,000 and over 500 population; 1 was under 1 year of age, 4 between 1 and 5, 1 between 5 and 10, 2 between 15 and 20, 4 between 20 and 30, 1 between 30 and 40, 4 between 40 and 50, 1 between 50 and 60, 2 between 60 and 70, 2 between 70 and 80, 5 not stated; 4 died in the month of January, 4 in February, 1 in March, 1 in April, 3 in May, 6 in June, 2 in July, 3 in August, 2 in September, 1 in November. The number dying from contagious diseases is as follows: 2 males from typhoid fever, 1 male and 1 female from cholera infantum, 5 males and 1 female from consumption, 1 female from diphtheria.

In FORD county, the total number of deaths returned is 35. Of these, 23 were males, 12 females; all were white; of their nativity, 17 were born in Kansas, 18 in

United States; 21 were single, 12 married, 2 not stated; 14 died in cities and towns of 500 to 5,000 population, 3 in towns or villages under 500 population, or in the country; 12 were under 1 year of age, 3 between 1 and 5, 1 between 5 and 10, 1 between 10 and 15, 3 between 15 and 20, 4 between 20 and 30, 4 between 30 and 40, 3 between 40 and 50, 2 between 60 and 70, 2 between 70 and 80; of the number, 2 died in the month of January, 3 in February, 1 in May, 5 in June, 7 in July, 7 in August, 5 in September, 2 in November, 8 in December. The number dying from contagious diseases is as follows: 1 female from diphtheria, 1 male and 1 female from whooping-cough, 2 males and 1 female from cholera infantum, 3 males from consumption.

In FRANKLIN county, the total number of deaths returned is 17. Of these, 7 were males, 10 females; 8 were white, 9 were not stated; 8 were single, 7 married, and 2 widows; of their nativity, 10 were born in Kansas, 6 in other portions of the United States, 1 was foreign-born; of the number, 3 died under 1 year of age, 2 between 1 and 5, 2 between 5 and 10, 2 between 20 and 30, 1 between 30 and 40, 2 between 40 and 50; 1 between 50 and 60, 1 between 60 and 70, 1 between 70 and 80, 1 between 80 and 90; of the number, 5 died in the month of January, 1 in March, 1 in May, 1 in June, 2 in July, 4 in August, 1 in September, 1 in October. The number dying from contagious diseases is as follows; 1 female from diphtheria and croup, 1 female from consumption, 1 male from cholera infantum, 1 male and 1 female from typhoid fever.

In GARFIELD county, the total number of deaths returned is 3. All were males; all were white; 2 were single, 1 married; all died in towns or villages under 500 population, or in the country; 2 were between 10 and 15 years of age, 1 between 40 and 50; 1 died in the month of January, 1 in August, 1 in September. The number dying from contagious diseases is as follows: 2 males from typhoid fever.

In GEARY county, the total number of deaths returned is 92. Of these, 47 were males, 34 females, 11 not stated; 18 were under 1 year of age, 19 between 1 and 5, 2 between 10 and 15, 6 between 15 and 20, 16 between 20 and 30, 6 between 30 and 40, 8 between 40 and 50, 4 between 50 and 60, 4 between 60 and 70, 6 between 70 and 80, 3 between 80 and 90; of the number, 7 died in the month of January, 12 in February, 6 in March, 8 in April, 10 in May, 6 in June, 10 in July, 10 in August, 10 in September, 5 in October, 4 in November, 3 in December. The number dying from contagious diseases is as follows: 2 males and 2 females from measles, 2 males and 4 females from typhoid fever, 3 males and 4 females from consumption.

In GRAY county, the total number of deaths returned is 3. Of these, 2 were males and 1 female; all were white; of their nativity, all were American-born; 2 were married, 1 was not stated; 2 died in towns and cities under 5,000 and over 500 population; 1 died under 1 year of age, 1 between 30 and 40, 1 between 60 and 70. The number dying from contagious diseases is as follows: 1 from consumption.

In GREELEY county, the total number of deaths returned is 12. Of these, 5 were males, 8 females; all were white; of their nativity, 7 were born in Kansas, 5 in other portions of the United States; 9 were single, 4 married; all died in towns of less than 500 population, or in the country; 6 were under 1 year of age, 1 between 1 and 5, 2 between 15 and 20, 1 between 20 and 30, 1 between 30 and 40, 1 between 40 and 50, 1 between 50 and 60; of the number, 2 died in the month of January, 4 in March, 1 in April, 1 in May, 1 in June, 2 in July, 1 in August, 1 in November. The number

dying from contagious diseases is as follows: 2 males and 4 females from cholera infantum.

In GREENWOOD county, the total number of deaths returned is 49. Of these, 26 were males, 17 females; all were white; of their nativity, 22 were born in Kansas, 17 in other portions of the United States, 3 were foreign-born, 1 not stated; 26 were single, 13 married, 1 widow; 16 died in towns of under 5,000 and over 500 population, 32 in towns or villages under 500 population, or in the country; 4 were under 1 year of age, 10 between 1 and 5, 2 between 5 and 10, 3 between 10 and 15, 5 between 15 and 20, 2 between 20 and 30, 35 between 30 and 40, 3 between 40 and 50, 2 between 50 and 60, 2 between 60 and 70, 5 between 70 and 80, 2 between 80 and 90; of the number, 11 died in the month of January, 6 in February, 4 in March, 6 in April, 2 in May, 1 in June, 3 in July, 3 in August, 3 in September, 2 in October, 3 in November, 2 in December. The number dying from contagious diseases is as follows: 4 males and 4 females from diphtheria, 1 female from cholera infantum, 1 male from typhoid fever.

In HARVEY county, the total number of deaths returned is 95. Of these, 57 were males, 38 females; all were white; of their nativity, 72 were born in Kansas, 22 in other portions of the United States, 1 was foreign-born; 69 were single, 25 married, 1 widow; 80 died in cities and towns of over 5,000 population, 3 in towns under 5,000 and over 500 population, 12 in towns or villages under 500 population, or in the country; 23 were under 1 year of age, 8 between 1 and 5, 6 between 5 and 10, 2 between 10 and 15, 1 between 15 and 20, 8 between 20 and 30, 5 between 30 and 40, 7 between 40 and 50, 4 between 50 and 60, 6 between 60 and 70, 4 between 70 and 80, 1 between 80 and 90, 1 not stated; of the number, 1 died in the month of January, 5 in February, 8 in March, 13 in April, 10 in May, 9 in June, 10 in July, 10 in August, 9 in September, 9 in October, 7 in November. The number dying from contagious diseases is as follows: 1 female from measles, 2 males from scarlet fever, three males and 2 females from diphtheria, 3 males and 2 females from whooping-cough, 2 males and 3 females from enteric fever, 2 females from cholera infantum, 3 males and 4 females from consumption.

In HODGEMAN county, the total number of deaths returned is 8. Of these 5 were males, 3 females; 6 were white, 2 colored; of their nativity, 5 were born in Kansas, 3 in other portions of the United States; 5 were single, 3 married; all died in towns or villages under 500 population, or in the country; 3 were under one year of age, 1 between 1 and 5, 1 between 10 and 15, 1 between 40 and 50, 2 between 50 and 60; of the number, 1 died in the month of May, 1 in June, 1 in July, 1 in August, 3 in September, 1 in December. The number dying from contagious diseases is as follows: 1 female from whooping-cough, 1 female from consumption.

In JEFFERSON county, the total number of deaths returned is 2. Of these, 1 was a male, 1 female; all were white; of their nativity, 1 was born in Kansas, 1 in other portions of the United States; 1 was single, 1 married; 2 died in towns or villages under 500 population, or in the country; 1 was under 1 year of age, 1 between 30 and 40; 1 died in the month of May, 1 in June.

In JEWELL county, the total number of deaths returned is 103. Of these, 39 were males, 23 females, 41 not stated; 15 were under 1 year of age, 12 between 1 and 5, 3 between 5 and 10, 2 between 10 and 15, 5 between 15 and 20, 5 between 20 and 30, 5 between 30 and 40, 6 between 40 and 50, 12 between 50 and 60, 16 between 60 and 70,

14 between 70 and 80, 4 between 80 and 90, 8 not stated; of the number, 9 died in the month of January, 11 in February, 10 in March, 5 in April, 7 in May, 7 in June, 11 in July, 13 in August, 15 in September, 3 in October, 4 in November, 7 in December. The number dying from contagious diseases is as follows: 1 from measles, 2 from scarlet fever, 1 male from diphtheria, 1 male and 2 females from typhoid fever, 4 males and 2 females from consumption, 1 from cholera infantum.

In JOHNSON county, the total number of deaths reported is 54. Of these, 25 were males and 29 females; 49 were white, 5 colored; of their nationality, 18 were born in Kansas, 25 in the United States, 7 were foreign-born, 4 not stated; 25 died in towns under 5,000 and over 500 population, 29 in towns or villages under 500 population, or in the country; 9 died under 1 year of age, 6 between 1 and 5, 2 between 5 and 10, 3 between 10 and 15, 3 between 15 and 20, 5 between 20 and 30, 2 between 30 and 40, 4 between 40 and 50, 6 between 50 and 60, 3 between 60 and 70, 9 between 70 and 80, 1 between 80 and 90, 1 not stated; of the number, 6 died in the month of January, 4 in February, 4 in March, 4 in April, 3 in May, 2 in June, 11 in July, 3 in August, 5 in September, 6 in October, 3 in November, 3 in December. The number dying from contagious diseases is as follows: 1 male from measles, 1 male and 2 females from enteric fever, 1 male and 3 females from consumption.

In KEARNY county, the total number of deaths returned is 7. Of these, 4 were males, and 3 females; all were white; of their nationality, 5 were born in Kansas, 1 in the United States, 1 was foreign-born; 5 were single, 1 married, 1 widow; all died in towns or villages under 500 population, or in the country; 3 were under 1 year of age, 1 between 1 and 5, 1 between 40 and 50, 1 between 60 and 70, 1 between 70 and 80; of the number, 1 died in the month of January, 1 in February, 2 in March, 1 in April, 1 in June, 1 in July. The number dying from contagious diseases is as follows: 1 male and 1 female from consumption, 1 male from croup.

In KINGMAN county, the total number of deaths returned is 29. Of this number, 15 were males and 14 females; 27 were white and 2 colored; of their nativity, 8 were born in Kansas, 21 in other portions of the United States; 12 were single, 24 married, 3 widows; 22 died in towns under 5,000 and over 500 population, 7 in towns or villages under 500 population, or in the country; 10 were under 1 year of age, 1 between 15 and 20, 1 between 20 and 30, 4 between 40 and 50, 4 between 50 and 60, 5 between 60 and 70, 1 between 70 and 80, 2 between 80 and 90, 1 not stated; of the number, 2 died in the month of January, 1 in February, 5 in March, 3 in April, 4 in May, 7 in July, 1 in August, 1 in October, 4 in November, 1 in December. The number dying from contagious diseases is as follows: 1 female from cholera infantum, 1 male and 1 female from consumption.

In LABETTE county, the total number of deaths returned is 73. Of these, 35 were males, 33 females, 5 not stated; 53 were white, 7 colored, 13 not stated; of their nationality, 18 were born in Kansas, 40 in other portions of the United States, 5 were foreign-born, 10 not stated; 31 were single, 23 married, 3 widowers, 6 widows, 5 not stated; 6 died in cities or towns over 5,000 population, 26 in towns under 5,000 and over 500 population, 41 in towns or villages under 500 population, or in the country; 14 were under 1 year of age, 8 between 1 and 6, 3 between 5 and 10, 1 between 10 and 15, 2 between 15 and 20, 11 between 20 and 30, 5 between 30 and 40, 8 between 40 and 50, 8 between 50 and 60, 5 between 60 and 70, 3 between 70 and 80, 2 between 80 and 90, 2 not stated; of the number, 15 died in the month of January, 7 in February, 8 in March, 6 in April, 7 in May, 7 in June, 4 in July, 6 in August, 5

in September, 1 in October, 5 in November, 2 in December. The number dying from contagious diseases is as follows: 1 male and 1 female from scarlet fever, 1 female from whooping-cough, 1 male and 1 female from enteric fever, 2 males and 8 females from consumption.

In LANE county, the total number of deaths returned is 28. Of these, 16 were males, 12 females; all were white; of their nationality, 8 were born in Kansas, 17 in other portions of the United States, 3 not stated; 18 were single, 8 married, 1 widow, 1 not stated; all died in towns under 500 population, or in the country; 5 were under 1 year of age, 6 between 1 and 5, 5 between 5 and 10, 1 between 10 and 15, 4 between 15 and 20, 3 between 40 and 50, 1 between 50 and 60, 1 between 60 and 70, 1 between 70 and 80; of the number, 2 died in the month of January, 2 in February, 3 in March, 4 in April, 4 in May, 4 in July, 4 in August, 2 in September, 1 in October, 2 in November. The number dying from contagious diseases is as follows: 2 males from enteric fever, 6 males and 3 females from diphtheria, 1 male and 2 females from phthisis.

In LEAVENWORTH county, the total number of deaths returned is 5. Of these, 3 were males, 2 females; 4 were white, 1 colored; of their nativity, 4 were born in Kansas, 1 was foreign-born; all were single; 4 died in cities over 5,000 population, 1 in town or village under 500 population, or in the country; 2 died under 1 year of age, 2 between 5 and 10, 1 between 15 and 20; 1 died in the month of January, 1 in February, 1 in April, 1 in May, 1 in December. The number dying from contagious diseases is as follows: 1 male and 1 female from measles.

In LYON county, the total number of deaths returned is 19. Of these, 6 were males, 13 females; 18 were white, 1 colored; of their nativity, 5 were born in Kansas, 13 in other portions of the United States, and 1 was foreign-born; 9 were single, 5 married, 4 widows; 7 died in towns under 5,000 and over 500 population, and in the country; 4 were under 1 year of age, 1 between 1 and 5, 2 between 10 and 15, 3 between 20 and 30, 4 between 30 and 40, 1 between 40 and 50, 1 between 50 and 60, 2 between 70 and 80; 5 died in the month of January, 2 in February, 2 in April, 3 in June, 1 in July, 1 in August, 2 in October, 1 in November, 2 in December. The number dying from contagious diseases is as follows: 1 male from small-pox, 2 females from scarlet fever, 1 female from cholera infantum, 1 female from consumption.

In MARION county, the total number of deaths returned is 122. Of these, 59 were males, 46 females, 17 not stated; 121 were white, 1 not stated; of their nativity, 44 were born in Kansas, 43 in other portions of the United States, 8 were foreign-born, 27 not stated; 40 were single, 13 married, 4 widowers, 2 widows, 63 not stated; 2 died in cities or towns of over 5,000 population, 91 in towns under 5,000 and over 500 population, 29 in towns or villages under 500 population, or in the country; 28 were under 1 year of age, 14 between 1 and 5, 8 between 5 and 10, 6 between 10 and 15, 3 between 15 and 20, 12 between 20 and 30, 14 between 30 and 40, 6 between 40 and 50, 8 between 50 and 60, 6 between 60 and 70, 10 between 70 and 80, 2 between 80 and 90, 5 not stated; of the number, 11 died in the month of January, 16 in February, 10 in March, 8 in April, 12 in May, 7 in June, 13 in July, 14 in August, 9 in September, 5 in October, 4 in November, 13 in December. The number dying from contagious diseases is as follows: 3 males and 1 female from measles, 1 male from scarlet fever, 1 female from diphtheria, 2 females from whooping-cough, 6 females, the sex of 2 not given, from cholera infantum, 7 males and 3 females from consumption, 2 males and 1 female from typhoid fever.

In McPHERSON county, the total number of deaths returned is 34. Of these, 20 were males, 14 females; all were white; of their nativity, 1 was born in Kansas, 17 in other portions of the United States, 11 were foreign-born, 5 not stated; 16 were single, 16 married, 2 widowers, 3 not stated; 7 died in cities or towns of over 5,000 population, 8 in towns under 5,000 and over 500 population, 19 in towns or villages under 500 population, or in the country; 1 was under 1 year of age, 10 between 1 and 5, 5 between 5 and 10, 2 between 10 and 15, 3 between 20 and 30, 2 between 30 and 40, 1 between 40 and 50, 3 between 50 and 60, 4 between 60 and 70, 1 between 70 and 80, 1 over 90; of the number, 5 died in the month of January, 2 in February, 1 in March, 3 in April, 8 in May, 3 in July, 2 in September, 3 in October, 1 in November, 11 in December. The number dying from contagious diseases is as follows: 1 female from measles, 1 male from scarlet fever, 1 male and 1 female from cholera infantum.

In MEADE county, the total number of deaths returned is 5. Of this number, 3 were males, and 2 females; all were white; of their nativity, 1 was born in Kansas, 4 in other portions of the United States; 3 were single, 1 married, and 1 widower; all died in towns or villages under 500 population, or in the country; 1 was under 1 year of age, 1 between 1 and 5, 1 between 20 and 30, 1 between 30 and 40, 1 between 60 and 70; of the number, 1 died in the month of March, 1 in May, 1 in July, 1 in August, 1 in October. The number dying from contagious diseases is as follows: 1 female from consumption.

In MIAMI county, the total number of deaths returned is 49. Of these, 33 were males, 16 females; 45 were white, 4 colored; of their nativity, 6 were born in Kansas, 39 in other portions of the United States, 5 were foreign-born; 22 were single, 17 married, 3 widowers, 2 widows, 5 not stated; 4 were under 1 year of age, 8 between 1 and 5, 1 between 5 and 10, 1 between 15 and 20, 6 between 20 and 30, 4 between 30 and 40, 8 between 40 and 50, 6 between 50 and 60, 3 between 60 and 70, 2 between 70 and 80, 2 between 80 and 90, 1 over 90, 1 not stated; of the number, 5 died in the month of January, 5 in February, 2 in March, 7 in May, 1 in June, 2 in July, 4 in August, 3 in September, 8 in October, 4 in November, 2 in December. The number dying from contagious diseases is as follows: 2 males and 1 female from scarlet fever, 6 males and 2 females from cholera infantum, 8 males and 3 females from consumption, 1 female from croup.

In MONTGOMERY county, the total number of deaths returned is 46. Of these, 25 were males, 18 females, 3 not stated; 38 were white, 8 not stated; of their nativity, 16 were born in Kansas, 17 in other portions of the United States, 8 were foreign-born, 5 not stated; 22 were single, 14 married, 4 widowers, 1 widow, 4 not stated; 16 died in cities or towns of over 5,000 population, 10 in towns under 5,000 and over 500 population, or in the country; 7 were under 1 year of age, 7 between 1 and 5, 3 between 5 and 10, 1 between 10 and 15, 2 between 15 and 20, 9 between 20 and 30, 2 between 30 and 40, 1 between 40 and 50, 6 between 50 and 60, 3 between 60 and 70, 2 between 70 and 80, 3 between 80 and 90; of the number, 12 died in the month of January, 7 in February, 3 in April, 2 in May, 1 in June, 4 in July, 1 in August, 3 in September, 1 in October, 3 in November, 5 in December. The number dying from contagious diseases is as follows: 2 females from cholera infantum, 3 males and 4 females from consumption, 1 female from whooping-cough.

In NEMAH county, the total number of deaths returned is 34. Of these, 25 were males, and 9 females; all were white; of their nativity, 13 were born in Kansas, 12

in other portions of the United States, 4 were foreign-born, and 5 whose nativity is not given; 14 were married, 2 widowers, and 18 single; 4 died in towns under 5,000 and over 500 population, and 30 died in towns or villages under 500 population, or in the country; 9 were under one year of age, 4 between 1 and 5, 3 between 5 and 10, 1 between 15 and 20, 2 between 20 and 30, 4 between 40 and 50, 4 between 50 and 60, 4 between 60 and 70, and 3 between 70 and 80; of the number, 2 died in the month of January, 3 in February, 4 in March, 4 in April, 2 in May, 5 in July, 5 in August, 3 in September, 2 in October, 2 in November, and 2 in December. The number dying from contagious diseases is as follows: 4 males and 2 females from cholera infantum, 3 males from cerebro-spinal meningitis, 1 male and 1 female from enteric fever, 1 male from measles, and 1 male from diphtheria.

In NESS county, the total number of deaths returned is 33. Of these, 15 were males, 18 females; all were white; of their nativity, 15 were born in Kansas, 10 in other portions of the United States, and 6 were foreign-born; 17 were single, 11 married, 1 widower, 1 widow, 2 not stated; 5 died in towns under 5,000 and over 500 population, 27 in towns or villages under 500 population, or in the country: 2 were under 1 year of age, 5 between 1 and 5, 5 between 5 and 10, 2 between 10 and 15, 1 between 15 and 20, 1 between 20 and 30, 3 between 30 and 40, 2 between 40 and 50, 2 between 50 and 60, 5 between 60 and 70, 1 between 70 and 80, 1 not stated; of the number, 8 died in the month of January, 3 in February, 1 in March, 3 in April, 4 in May, 3 in June, 7 in August, 1 in October, 2 in December. The number dying from contagious diseases is as follows: 2 males and 1 female from scarlet fever, 2 males from diphtheria, 1 male and 1 female from consumption.

In OSAGE county, the total number of deaths returned is 40. Of these, 22 were males and 18 were females; 38 were white, and 2 colored; of their nationality, 18 were born in Kansas, 18 in other portions of the United States, 3 were foreign-born, and 1 not stated; 21 were single, 15 married, 2 widowers, 2 widows; 23 died in towns under 5,000 and over 500 population, and 17 in towns or villages under 500 population, or in the country; 8 were under 1 year of age, 10 between 1 and 5, 2 between 15 and 20, 2 between 20 and 30, 5 between 30 and 40, 5 between 40 and 50, 1 between 50 and 60, 3 between 60 and 70, 1 between 70 and 80, 2 between 80 and 90, and 1 not stated; of the number, 3 died in January, 4 in February, 3 in March, 5 in April, 3 in May, 1 in June, 4 in July, 6 in August, 4 in September, 6 in October, 1 in November. The number dying from contagious diseases is as follows: 1 male and 1 female from diphtheria, 1 male from whooping-cough, 3 females from phthisis, 1 female from croup.

In OSBORNE county, the total number of deaths returned is 87. Of these, 39 were males, 47 females, the sex of 1 not stated; all were white; of their nativity, 26 were born in Kansas, 30 in other portions of the United States, 1 were foreign born, 25 not stated; 39 were single, 34 married, 1 widower, 2 widows, 11 not stated; 31 died in towns under 5,000 and over 500 population, 56 in towns or villages under 500 population, or in the country; 13 were under 1 year of age, 12 between 1 and 5, 5 between 5 and 10, 2 between 10 and 15, 5 between 15 and 20, 8 between 20 and 30, 7 between 30 and 40, 4 between 40 and 50, 11 between 50 and 60, 6 between 60 and 70, 8 between 70 and 80, 3 between 80 and 90, 3 not stated; of the number, 10 died in the month of January, 8 in February, 13 in March, 5 in April, 7 in May, 3 in June, 7 in July, 14 in August, 9 in September, 3 in October, 6 in November, 2 in December. The number dying from contagious diseases is as follows: 2 females from scarlet

fever, 1 male, 2 females from typhoid fever, 2 males from cholera infantum, 1 female from puerperal fever, 4 males, 7 females from consumption.

IN PHILLIPS county, the total number of deaths returned is 70. Of these, 37 were males, 28 females, and 6 not stated; 67 were white, 1 colored, 2 not stated; of their nativity, 19 were born in Kansas, 40 in other portions of the United States, 4 were foreign-born, 7 not stated; 30 were single, 21 married, 2 widowers, 2 widows, 15 not stated; 20 died in towns under 5,000 and over 500 population, 50 in towns or villages under 500 population, or in the country; 16 were under 1 year of age, 7 between 1 and 5, 5 between 5 and 10, 2 between 10 and 15, 2 between 15 and 20, 6 between 20 and 30, 6 between 30 and 40, 5 between 40 and 50, 7 between 50 and 60, 4 between 60 and 70, 9 between 70 and 80, 1 between 80 and 90; of the number, 7 died in the month of January, 3 in February, 12 in March, 9 in April, 8 in May, 7 in June, 8 in July, 9 in August, 3 in September, 1 in October, 1 in November, 1 in December. The number dying from contagious diseases is as follows: 2 from measles, 2 females from diphtheria, 2 males, 1 female, 1 sex not stated from whooping-cough, 2 females from typhoid fever, 2 females from puerperal fever, 5 males, 4 females from consumption.

IN POTTAWATOMIE county, the total number of deaths returned is 22. Of these, 15 were males, 6 females, 1 not stated; all were white; of their nativity, 7 were born in Kansas, 13 in other portions of the United States, 2 were foreign-born; 11 were single, 7 married, 3 widowers, 1 widow; 2 died in towns under 5,000 and over 500 population, 20 in towns or villages under 500 population, or in the country; 5 were under 1 year of age, 1 between 1 and 5, 1 between 15 and 20, 2 between 20 and 30, 2 between 30 and 40, 1 between 40 and 50, 2 between 50 and 60, 5 between 70 and 80, and 3 over 90; of the number, 2 died in the month of January, 2 in February, 1 in March, 4 in April, 3 in May, 1 in June, 2 in July, 1 in August, 1 in September, 4 in November, 1 in December. The number dying from contagious diseases is as follows: 1 male from typhoid fever, 1 female from cholera infantum, 3 males from consumption, 1 male from croup.

IN RAWLINS county, the total number of deaths returned is 20. Of these, 11 are males, and 9 are females; all were white; of their nationality, 3 were born in Kansas, 16 in United States, and 1 was foreign-born; all died in towns or villages under 500 population, or in the country; 8 were under 1 year of age, 1 between 1 and 5 years, 1 between 5 and 10, 2 between 10 and 15, 1 between 30 and 40, 3 between 40 and 50, 1 between 50 and 60, 2 between 70 and 80, 1 between 80 and 90; of the number, 1 died in the month of January, 2 in February, 1 in March, 1 in May, 6 in July, 3 in August, 1 in September, 2 in October, 3 in November. The number dying from contagious diseases is as follows: 1 male from diphtheria, 1 female from enteric fever.

IN RENO county, the total number of deaths returned is 203. Of these, 23 died in the month of January, 7 in February, 25 in March, 24 in April, 16 in May, 15 in June, 22 in July, 15 in August, 13 in September, 19 in October, 19 in November, 13 in December. The number dying from contagious diseases is as follows: 9 from measles, 2 from scarlet fever, 2 from whooping-cough, 13 from cholera infantum, 1 from croup, 18 from consumption.

IN SHAWNEE county, the total number of deaths returned is 260. Of these, 126 were males, 119 females, 15 not stated; 151 were white, 17 colored, 92 not stated; of their nationality, 66 were born in Kansas, 83 in other portions of the United States,

13 were foreign-born, 98 not stated; 124 were single, 51 married, 4 widowers, 16 widows, 65 not stated; 204 died in cities or towns over 5,000 population, 10 in towns under 5,000 and over 500 population, 46 in towns or villages under 500 population, or in the country; 66 died under 1 year of age, 15 between 1 and 5, 13 between 5 and 10, 5 between 10 and 15, 10 between 15 and 20, 25 between 20 and 30, 27 between 30 and 40, 23 between 40 and 50, 26 between 50 and 60, 19 between 60 and 70, 19 between 70 and 80, 7 between 80 and 90, 5 not stated; of the number, 51 died in January, 30 in February, 23 in March, 30 in April, 24 in May, 21 in June, 23 in July, 34 in August, 10 in September, 9 in October, 5 in November. The number dying from contagious diseases is as follows: 1 male from measles, 1 male and 1 female from scarlet fever, 1 male from diphtheria, 3 males and 3 females from whooping-cough, 1 male and 1 female from enteric fever, 24 males and 27 females from consumption.

In SHERIDAN county, the total number of deaths returned is 9. Of these, 5 were males, and 4 were females; all were white; of their nationality, 4 were born in Kansas, 3 in the United States, 2 were foreign-born; 6 were single, 3 married; all died in towns or villages under 500 population, or in the country; 3 were under 1 year of age, 2 between 15 and 20, 1 between 20 and 30, 1 between 40 and 50, 1 between 50 and 60, 1 between 60 and 70. Of the number, 1 died in the month of May, 1 in June, 2 in July, 2 in August, 2 in October, 1 in December.

In SUERMAN county, the total number of deaths returned is 40. Of these, 21 were males, 13 females, 6 not stated; all were white; of their nativity, 15 were born in Kansas, 25 in other portions of the United States; 24 were single, 15 married, 1 widower; 7 died in towns under 5,000 and over 500 population, 33 in towns or villages under 500 population, or in the country; 13 were under 1 year of age, 1 between 1 and 5, 4 between 5 and 10, 1 between 20 and 30, 5 between 30 and 40, 4 between 40 and 50, 3 between 50 and 60, 2 between 60 and 70, 3 between 70 and 80, 2 between 80 and 90, 1 not stated. Of the number, 4 died in the month of February, 5 in March, 4 in April, 4 in May, 1 in June, 4 in July, 4 in August, 5 in September, 3 in October, 4 in November, 2 in December. The number dying from contagious diseases is as follows: 1 male and 1 female from diphtheria, 2 males and 1 female from typhoid fever, 1 male and 1 female, and 1 not stated, from cholera infantum, 3 males and 3 females from consumption.

In STANTON county, the total number of deaths returned is 4. All were males; all were white; all were born in different portions of the United States; 3 were single, 1 married; all died in towns or villages of less than 500 population, or in the country; 1 was between 15 and 20 years of age, 2 between 20 and 30, 1 between 30 and 40. Of the number, 1 died in the month of February, 1 in September, 1 in November, 1 in December. The number dying from contagious diseases is as follows: 1 male from consumption.

In THOMAS county, the total number of deaths returned is 43. Of these, 19 were males, 24 females; all were white; of their nativity, 19 were born in Kansas, 18 in other portions of the United States, 2 were foreign-born, 4 not stated; 23 were single, 16 married, 1 widower, 2 widows, 1 not stated; 13 died in towns of under 5,000 and over 500 population, 30 in towns and villages under 500 population, or in the country; 13 were under 1 year of age, 6 between 1 and 5, 3 between 5 and 10, 1 between 15 and 20, 1 between 20 and 30, 5 between 30 and 40, 1 between 40 and 50, 4 between 50 and 60, 6 between 60 and 70, 3 between 70 and 80; of the number, 3 died in the month of January, 4 in February, 9 in March, 3 in April, 3 in May, 2 in June, 5 in

July, 2 in August, 3 in September, 1 in October, 4 in November, 3 in December. The number dying from contagious diseases is as follows: 1 male from measles, 1 female from diphtheria, 1 male and 3 females from whooping-cough, 2 females from enteric fever, 1 male from cholera infantum, 4 females from consumption.

In WABAUNSEE county, the total number of deaths returned is 87. Of these, 45 were males, 42 females; 80 were white, 7 colored; of their nativity, 26 were born in Kansas, 43 in other portions of the United States, and eighteen were foreign-born; 49 were single, 28 married, 6 widowers, 3 widows, 1 not stated; 27 died in towns under 5,000 and over 500 population, 60 in towns or villages under 500 population, or in the country; 21 were under 1 year of age, 13 between 1 and 5, 4 between 5 and 10, 1 between 10 and 15, 3 between 15 and 20, 12 between 20 and 30, 5 between 30 and 40, 7 between 40 and 50, 6 between 60 and 70, 8 between 70 and 80, 1 over 90; of the number, 3 died in the month of January, 10 in February, 11 in March, 6 in April, 4 in May, 2 in June, 11 in July, 11 in August, 10 in September, 6 in October, 5 in November, 8 in December. The number dying from contagious diseases is as follows: 2 females from measles, 1 female from diphtheria, 1 male and two females from typhoid fever, 7 males and 5 females from cholera infantum, 4 males and 2 females from consumption.

In WILSON county, the total number of deaths returned is 21. Of these, 13 were males, 8 females, all were white; of their nativity, 13 were born in Kansas, 7 in other portions of the United States, 1 was foreign-born; 11 were single, 8 married, 1 widower, 1 widow; 4 died in towns under 5,000 or over 500 population, 17 in towns or villages under 500 population, or in the country; 5 were under 1 year of age, 1 between 1 and 5, 1 between 10 and 15, 3 between 15 and 20, 3 between 20 and 30, 2 between 30 and 40, 2 between 50 and 60, 3 between 60 and 70, 1 not stated; of the number, 8 died in the month of January, 1 in February, 2 in March, 2 in April, 1 in May, 2 in July, 1 in September, 4 in October. The number dying from contagious diseases is as follows: 2 males from cholera infantum, 1 female from consumption, 1 female from croup.

MARRIAGES.

The following is a list of counties, and number of marriages in each, that were reported to the Secretary of the State Board of Health by the county health officers, for the years 1888, 1889 and 1890.

| <i>Counties.</i> | <i>1888.</i> | <i>1889.</i> | <i>1890.</i> |
|------------------|--------------|--------------|--------------|
| Anderson..... | | 115 | |
| Brown..... | | | 160 |
| Butler..... | | 29 | |
| Chase..... | 13 | 2 | |
| Cheyenne..... | | 24 | |
| Clay..... | 119 | 141 | 143 |
| Cloud..... | 34 | 6 | |
| Colley..... | 150 | 119 | |
| Comanche..... | 40 | | 40 |
| Crawford..... | | 280 | |
| Decatur..... | 82 | 55 | 71 |
| Elk..... | 95 | | |
| Ellis..... | 67 | 24 | 59 |
| Ellsworth..... | 85 | 51 | 54 |
| Finney..... | 61 | 22 | 18 |
| Ford..... | 66 | 57 | 118 |
| Garfield..... | 22 | 11 | 2 |
| Geary..... | 72 | 84 | 90 |
| Greenwood..... | 46 | | 18 |
| Greeley..... | | 10 | 9 |
| Harvey..... | 152 | | 103 |

VITAL STATISTICS, (MARRIAGES,)—CONCLUDED.

| <i>Counties.</i> | <i>1888.</i> | <i>1889.</i> | <i>1890.</i> |
|-------------------|--------------|--------------|--------------|
| Hodgeman..... | 30 | | |
| Jewell..... | 109 | 105 | 149 |
| Johnson..... | 141 | 162 | 138 |
| Kearny..... | 98 | 88 | 18 |
| Kingman..... | | | 224 |
| Labette..... | 189 | 181 | 11 |
| Lane..... | | 16 | |
| Lincoln..... | 44 | | |
| Linn..... | 141 | 154 | |
| Marion..... | 73 | 131 | 166 |
| Marshall..... | 56 | 172 | 134 |
| McPherson..... | 118 | 167 | 81 |
| Miami..... | 173 | 179 | |
| Meade..... | | 23 | |
| Montgomery..... | 217 | 235 | 237 |
| Nemaha..... | 13 | 127 | 165 |
| Ness..... | | 37 | 22 |
| Norton..... | 23 | 130 | |
| Osage..... | | 4 | |
| Osborne..... | | 90 | 83 |
| Phillips..... | 118 | 113 | 104 |
| Pottawatomie..... | 121 | 104 | 102 |
| Pratt..... | 55 | | |
| Rawlins..... | 41 | 16 | 55 |
| Russell..... | | | 53 |
| Saline..... | 150 | | |
| Scott..... | | 28 | |
| Sedgwick..... | 521 | 452 | |
| Sheridan..... | 26 | | 21 |
| Sherman..... | 44 | 56 | 41 |
| Stanton..... | | | 8 |
| Stevens..... | | 18 | |
| Thomas..... | 49 | 43 | 30 |
| Wichita..... | 35 | 41 | |
| Wilson..... | 133 | 143 | 155 |
| Woodson..... | 99 | 74 | |
| Totals..... | 4,000 | 4,129 | 2,870 |

In BROWN county, the total number of marriages returned is 160: 156 of whom were white, and 4 colored. Of the number, 144 grooms and 149 brides were of American nationality, 15 grooms and 10 brides were of foreign nationality, 1 groom and 1 bride were not reported; 57 brides were under 20 years of age, 66 grooms and 64 brides were between 20 and 25, 57 grooms and 24 brides were between 25 and 30, 26 grooms and 10 brides were between 30 and 40, 6 grooms and 4 brides between 40 and 50, 1 groom between 50 and 60, 3 grooms between 60 and 70, 1 groom over 80, 1 bride not reported.

In CLAY county, the total number of marriages returned is 143; 136 of whom were white, and 7 not reported. Of the number, 104 grooms and 121 brides were of American nationality, 39 grooms and 22 brides were of foreign nationality; 38 brides were under 20 years of age, 42 grooms and 69 brides between 20 and 25, 60 grooms and 22 brides between 25 and 30, 30 grooms and 9 brides between 30 and 40, 5 grooms and 5 brides between 40 and 50, 2 grooms between 50 and 60, 3 grooms between 60 and 70, 1 groom between 70 and 80.

In COMANCHE county, the total number of marriages returned is 40, all of whom were white, and of American nationality; 6 brides were under 20 years of age, 1 groom and 8 brides between 20 and 25, 14 grooms and 3 brides between 25 and 30, 1 groom and 2 brides between 30 and 40, 1 groom and 1 bride between 40 and 50, 2 grooms between 50 and 60.

In DECATUR county, the total number of marriages returned is 71, all of whom were white. Of the number, 60 grooms and 62 brides were of American nationality.

10 grooms and 8 brides were of foreign nationality, 1 groom and 1 bride not reported; 1 groom and 25 brides were under 20 years of age, 24 grooms and 29 brides between 20 and 25, 21 grooms and 4 brides between 25 and 30, 18 grooms and 8 brides between 30 and 40, 2 grooms and 3 brides between 40 and 50, 4 grooms and 1 bride between 50 and 60, 1 groom between 60 and 70, 1 bride not reported.

In ELLIS county, the total number of marriages returned is 50, all of whom were white. Of the number, 26 grooms and 27 brides were of American nationality, 24 grooms and 23 brides were of foreign nationality; 1 groom and 22 brides were under 20 years of age, 25 grooms and 18 brides were between 20 and 25, 16 grooms and 3 brides between 25 and 30, 3 grooms and 3 brides between 30 and 40, 2 grooms between 40 and 50, 2 grooms and 2 brides between 50 and 60.

In ELLSWORTH county, the total number of marriages returned is 54, of whom all were white. Of the number, 35 grooms and 33 brides were of American nationality, while 19 grooms and 21 brides were of foreign nationality; 14 brides were under 20 years of age, 21 grooms and 31 brides were between 20 and 25, 22 grooms and 5 brides between 25 and 30, 6 grooms and 2 brides between 30 and 40, 4 grooms and 1 bride between 40 and 50, 1 groom between 50 and 60, 1 bride not reported.

In FINNEY county, the total number of marriages returned is 18, all of whom were white; 12 grooms and 12 brides were of American nationality, 1 groom and 1 bride were of foreign nationality, 5 grooms and 5 brides were not reported; 7 brides were under 20 years of age, 5 grooms and 6 brides between 20 and 25, 7 grooms and 3 brides between 25 and 30, 6 grooms and 2 brides between 30 and 40.

In FORD county, the total number of marriages returned is 118, all of whom were white; nationality not reported; 23 brides were under 20 years of age, 17 grooms and 19 brides between 20 and 25, 20 grooms and 9 brides between 25 and 30, 11 grooms and 3 brides between 30 and 40, 6 grooms and 4 brides between 40 and 50, 2 grooms and 1 bride between 50 and 60, 3 grooms between 60 and 70.

In GARFIELD county, the total number of marriages returned is 2, both of whom were white, and of American nationality; 1 bride was under 20 years of age, 1 groom and 1 bride between 20 and 25, 1 groom between 25 and 30.

In GEARY county, the total number of marriages returned is 90, 87 of whom were white, and 3 were colored; of the number, 57 grooms and 62 brides were of American nationality, 29 grooms and 28 brides were foreign-born, 4 were not reported; 24 brides were under 20 years of age, 39 grooms and 51 brides between 20 and 25, 28 grooms and 6 brides between 25 and 30, 19 grooms and 7 brides between 30 and 40, 3 grooms and 1 bride between 40 and 50, 1 groom between 60 and 70, 1 groom and 2 brides not reported.

In GREENWOOD county, the total number of marriages returned is 18, all of whom were white. Of the number, 17 grooms and 18 brides were of American nationality, 1 groom was of foreign nationality; 7 brides were under 20 years of age, 7 grooms and 8 brides between 20 and 25, 6 grooms and 3 brides between 25 and 30, 3 grooms between 30 and 40, 1 groom between 40 and 50.

In GREELEY county, the total number of marriages returned is 9, all of whom were white; 8 grooms and 9 brides were of American nationality, 1 groom was of foreign

nationality; 3 brides were under 20 years of age, 1 groom between 20 and 25, 3 grooms and 3 brides between 25 and 30, 4 grooms and 3 brides between 30 and 40, 1 groom between 40 and 50.

In HARVEY county, the total number of marriages returned is 103; all of whom were white; 81 grooms and 82 brides were of American nationality, 23 grooms and 20 brides were of foreign nationality, 1 groom and 1 bride not reported; 1 groom and 23 brides were under 20 years of age, 45 grooms and 52 brides between 20 and 25, 27 grooms and 13 brides between 25 and 30, 17 grooms and 6 brides between 30 and 40, 5 grooms and 5 brides between 40 and 50, 4 grooms and 3 brides between 50 and 60, 1 groom and 1 bride between 60 and 70, 1 groom between 70 and 80.

In JEWELL county, the total number of marriages returned is 149; all of whom were white; 136 grooms and 140 brides were of American nationality, 10 grooms and 6 brides were of foreign nationality, 3 grooms and 3 brides were not reported; 2 grooms and 56 brides were under 20 years, 62 grooms and 63 brides were between 20 and 25, 49 grooms and 15 brides between 25 and 30, 23 grooms and 11 brides between 30 and 40, 9 grooms and 2 brides between 40 and 50, 3 grooms and 2 brides between 50 and 60, 1 groom between 60 and 70.

In JOHNSON county, the total number of marriages returned is 138; 133 of whom were white, and 5 colored. Of the number, 3 grooms and 32 brides were under 20 years of age, 48 grooms and 36 brides were between 20 and 25, 18 grooms and 20 brides were between 25 and 30, 23 grooms and 10 brides between 30 and 40, 9 grooms and 5 brides between 40 and 50, 7 grooms and 2 brides between 50 and 60, 1 groom and 1 bride between 60 and 70, 1 groom between 70 and 80, 4 grooms and 4 brides not reported.

In KEARNY county, the total number of marriages returned is 18.

In LABETTE county, the total number of marriages returned is 226, 202 of whom are white, 19 colored, and 5 were not reported; 211 grooms and 217 brides were of American nationality, 9 grooms and 5 brides of foreign nationality, 6 grooms and 4 brides were not reported; 1 groom and 57 brides were under 20 years of age, 81 grooms and 119 brides between 20 and 25, 75 grooms and 24 brides between 25 and 30, 46 grooms and 12 brides between 30 and 40, 10 grooms and 6 brides between 40 and 50, 7 grooms and 5 brides between 50 and 60, 2 grooms and 1 bride between 60 and 70, 3 grooms between 70 and 80, 1 groom and 2 brides not reported.

In KINGMAN county, the total number of marriages returned is 83, of whom 82 were white, and 1 colored; 81 grooms and 82 brides were of American nationality, 2 grooms and 1 bride were of foreign nationality; 25 brides were under 20 years of age, 29 grooms and 38 brides between 20 and 25, 26 grooms and 6 brides between 25 and 30, 17 grooms and 9 brides between 30 and 40, 7 grooms and 2 brides between 40 and 50, 3 grooms and 2 brides between 50 and 60, 1 groom and 1 bride not reported.

In LANE county, the total number of marriages returned is 11: all were white. Of the number, 10 grooms and 10 brides were of American nationality, 1 groom and 1 bride were of foreign nationality; 1 bride was under 20 years of age, 5 grooms and 8 brides between 20 and 25, 2 grooms and 1 bride between 25 and 30, 3 grooms and 1 bride between 30 and 40, 1 groom between 40 and 50.

In MARION county, the total number of marriages returned is 166; all were white. Of the number, 87 grooms and 90 brides were of American nationality, 79 grooms and 76 brides were of foreign nationality; 58 brides were under 20 years of age, 73 grooms and 71 brides between 21 and 25, 64 grooms and 25 brides between 25 and 30, 24 grooms and 10 brides between 30 and 40, 5 grooms and 2 brides between 40 and 50.

In McPHERSON county, the total number of marriages returned is 134, all of whom were white; 75 grooms and 89 brides were of American nationality, 56 grooms and 42 brides were of foreign nationality, and 3 grooms and 3 brides not reported; 31 brides were under 20 years of age, 47 grooms and 63 brides between 20 and 25, 46 grooms and 23 brides between 25 and 30, 25 grooms and 5 brides between 30 and 40, 6 grooms and three brides between 40 and 50, 5 grooms and 4 brides between 50 and 60, 1 groom between 60 and 70, 4 grooms and 5 brides not reported.

In MEADE county, the total number of marriages returned is 16, all of whom were white; of this number, 14 grooms and 16 brides were of American nationality, while 2 grooms were of foreign nationality; 5 brides were under 20 years of age, 4 grooms and 7 brides between 20 and 25, 5 grooms and 4 brides between 25 and 30, 6 grooms between 30 and 40, 1 groom between 40 and 50.

In MIAMI county, the total number of marriages returned is 81, 80 of whom were white, and 1 colored. Of the number, 75 grooms and 76 brides were of American nationality, 8 grooms and 4 brides were of foreign nationality; 1 groom and 20 brides were under 20 years of age, 31 grooms and 31 brides were between 21 and 25, 21 grooms and 11 brides between 25 and 30, 16 grooms and 10 brides between 30 and 40, 9 grooms and 4 brides between 40 and 50, 3 grooms and 1 bride between 50 and 60, 2 grooms between 60 and 70.

In MONTGOMERY county, the total number of marriages returned is 227; 194 of whom were white, 13 colored, and 19 were not reported. Of the number, 174 grooms and 176 brides were of American nationality, 22 grooms and 19 brides were of foreign nationality, 16 grooms and 18 brides were not reported; 1 groom and 62 brides were under 20 years of age, 92 grooms and 101 brides were between 20 and 25, 71 grooms and 23 brides were between 25 and 30, 27 grooms and 13 brides were between 30 and 40, 16 grooms and 10 brides between 40 and 50, 13 grooms and 5 brides between 50 and 60, 3 grooms between 60 and 70, 4 grooms and 3 brides were not reported.

In NEMAH county, the total number of marriages returned is 165; of whom 163 were white, and 2 colored. Of the number, 123 grooms and 120 brides were of American nationality, while 42 grooms and 45 brides were of foreign nationality; 64 brides were under 20 years of age, 71 grooms and 68 brides between 20 and 25, 58 grooms and 21 brides between 25 and 30, 21 grooms and 5 brides between 30 and 40, 8 grooms and 4 brides between 40 and 50, 4 grooms and 3 brides between 50 and 60, 2 grooms between 60 and 70, 1 groom between 70 and 80.

In NESS county, the total number of marriages returned is 21, all of whom were white. Of the number, 21 grooms and 20 brides were of American nationality, 1 bride of foreign nationality; 1 groom and 11 brides were under 20 years of age, 6 grooms and 5 brides between 20 and 25, 8 grooms and 2 brides between 25 and 30, 4 grooms and 1 bride between 30 and 40, 1 groom and 1 bride between 40 and 50, 1 groom between 60 and 70.

In OSBORNE county, the total number of marriages returned is 88, all of whom were white; 78 grooms and 79 brides were of American nationality; 8 grooms and 6 brides were of foreign nationality, 2 grooms and 8 brides were not reported; 6 grooms and 25 brides were under 20 years of age, 41 grooms and 40 brides between 20 and 25, 26 grooms and 9 brides between 25 and 30, 12 grooms and 4 brides between 30 and 40, 3 grooms and 1 bride between 40 and 50, 1 groom and 2 brides between 50 and 60, 2 grooms and 2 brides between 60 and 70, 1 groom between 70 and 80, 1 groom over 80.

In PHILLIPS county, the total number of marriages returned is 104. Of these, 102 were white, 2 colored; 94 grooms and 84 brides were of American nationality, 7 grooms and 8 brides were of foreign nationality, 12 brides not reported; 5 grooms and 50 brides were under 20 years of age, 41 grooms and 31 brides between 20 and 25, 31 grooms and 8 brides between 25 and 30, 18 grooms and 6 brides between 30 and 40, 2 grooms and 2 brides between 40 and 50, 3 grooms and 2 brides between 50 and 60, 2 grooms between 60 and 70.

In POTTAWATOMIE county, the total number of marriages returned is 102; 101 of whom were white, and 1 colored; 78 grooms and 83 brides were of American nationality, 20 grooms and 11 brides were of foreign nationality, 4 grooms and 8 brides were not reported; 19 brides were under 20 years of age, 33 grooms and 57 brides between 21 and 25, 36 grooms and 15 brides between 25 and 30, 23 grooms and 5 brides between 30 and 40, 4 grooms and 3 brides between 40 and 50, 1 groom between 50 and 60, 1 groom between 60 and 70, the ages of 4 grooms and 2 brides not reported.

In RAWLINS county, the total number of marriages returned is 55; all were white; of the number, 43 brides and 41 grooms were of American nationality, 14 grooms and 12 brides were of foreign nationality; 16 brides were under 20 years of age, 14 grooms and 32 brides between 20 and 25, 28 grooms and 5 brides between 25 and 30, 10 grooms and 2 brides between 30 and 40, 3 grooms and 1 bride between 40 and 50.

In RENO county, the total number of marriages returned is 282, all of whom were white; 4 grooms and 73 brides were under 20 years of age, 75 grooms and 120 brides between 20 and 25, 84 grooms and 28 brides between 25 and 30, 50 grooms and 27 brides between 30 and 40, 12 grooms and 8 brides between 40 and 50, 8 grooms and 6 brides between 50 and 60, 4 grooms and 1 bride between 60 and 70, 1 groom between 70 and 80.

In RUSSELL county, the total number of marriages returned is 53, all of whom were white. Of the number, 47 grooms and 47 brides were of American nationality, while 6 grooms and 6 brides were of foreign nationality; 2 grooms and 25 brides were under 20 years of age, 21 grooms and 20 brides between 20 and 25, 12 grooms and 4 brides between 25 and 30, 13 grooms and 4 brides between 30 and 40, 3 grooms and 2 brides between 40 and 50, 2 grooms between 50 and 60.

In SHERIDAN county, the total number of marriages returned is 21, all of whom were white. Of the number, 16 grooms and 19 brides were of American nationality, 5 grooms and 2 brides were foreign-born; 1 groom and 5 brides were under 20 years of age; 4 grooms and 9 brides between 20 and 25; 5 grooms and 4 brides between 25 and 30; 6 grooms and 1 bride between 30 and 40; 4 grooms and 2 brides between 40 and 50, 1 groom between 50 and 60.

In SHERMAN county, the total number of marriages returned is 41, all of whom were white. Of the number, 37 grooms and 37 brides were of American nationality, 4 grooms and 4 brides were of foreign nationality; 11 brides were under 20 years of age, 8 grooms and 22 brides between 20 and 25, 17 grooms and 3 brides between 25 and 30, 14 grooms and 4 brides between 30 and 40, 1 groom between 40 and 50, 1 groom and 1 bride between 50 and 60.

In STANTON county, the total number of marriages reported is 8. All were white; 2 grooms and 2 brides were of American nationality, 1 groom and 1 bride of foreign nationality, 1 groom and 1 bride not reported; 1 bride was under 20 years of age, 1 groom and 3 brides between 20 and 25, 4 grooms and 1 bride between 25 and 30, 1 groom and 1 bride between 30 and 40, 1 groom and 1 bride between 50 and 60.

In THOMAS county, the total number of marriages returned is 30. All were white; of the number, 27 grooms and 28 brides were of American nationality, 3 grooms and 2 brides of foreign nationality; 8 brides were under 20 years of age, 3 grooms and 16 brides between 20 and 25, 18 grooms and 5 brides between 25 and 30, 9 grooms and 1 bride between 30 and 40.

In WILSON county, the total number of marriages returned is 155, 154 of whom were white, and one colored; of the number, 149 grooms and 155 brides were of American nationality, while 6 grooms were of foreign nationality; 1 groom and 51 brides were under 20 years of age, 56 grooms and 72 brides between 20 and 25, 58 grooms and 21 brides between 25 and 30, 28 grooms and 8 brides between 30 and 40, 6 grooms and 1 bride between 40 and 50, 5 grooms and 2 brides between 50 and 60, 1 groom between 60 and 70.

METEOROLOGICAL.

Below will be found very thorough and instructive monthly weather reports for the year 1890, followed by a meteorological summary. All of these were prepared by Prof. F. H. Snow, President of the University of Kansas, from observations taken at Lawrence, and are furnished by him for publication in this report. Anyone will be well repaid to examine and study them carefully and thoroughly:

WEATHER REPORT FOR JANUARY, 1890.

The temperature was above the average, but there have been nine warmer Januaries on our 23 years' record—in 1869, 1870, 1871, 1874, 1876, 1878, 1880, 1882, and 1889. The rainfall was more than twice the average, and has been exceeded in only two preceding Januaries. The cloudiness was much above the average, and the wind velocity was nearly normal.

MEAN TEMPERATURE—27.43 degrees, which is 2.36 deg. above the January average. The highest temperature was 63 deg. on the 30th; the lowest was 5 deg. below zero on the 16th, giving a range of 68 deg. Mean temperature at 7 A.M., 23.24 deg.; at 2 P.M., 32.97 deg.; at 9 P.M., 26.76 deg.

RAINFALL—including melted snow and sleet—2.50 inches, which is 1.28 inches above the January average. Rain and snow in measurable quantities fell on 3 days. There was no thunder shower. The entire depth of snow was 8 inches, giving two weeks of excellent sleighing.

MEAN CLOUDINESS—57.04 per cent. of the sky, the month being 9.05 per cent. cloudier than usual. Number of clear days (less than one third cloudy), 10; half-clear (from one to two-thirds cloudy), 11; cloudy (more than two-thirds), 10. There were 3 entirely clear days, and 7 entirely cloudy. Mean cloudiness at 7 A.M., 57.26 per cent.; at 2 P.M., 61.61 per cent.; at 9 P.M., 52.26 per cent.

WIND.—N.W. 30 times, S.W. 18 times, S.E. 14 times, S. 10 times, N. 8 times, W. 5 times, E. 4 times, N.E. 4 times. The total run of the wind was 11,508 miles, which is 200 miles below the January average. This gives a mean daily velocity of 373.55 miles, and a mean hourly velocity of 15.54 miles. The highest velocity was 72 miles an hour, from 12:05 to 12:10 A.M. on the 11th.

BAROMETER.—Mean for the month, 29.242 inches; at 7 A.M., 20.253 inches; at 2 P.M., 29.221 inches; at 9 P.M., 29.252 inches; maximum, 29.783 inches, on the 16th; minimum, 28.652 inches, on the 26th; monthly range, 1.131 inches.

RELATIVE HUMIDITY.—Mean for the month, 81.9; at 7 A.M., 89.5; at 2 P.M., 70.29; at 9 P.M., 86.0; greatest, 100, on 18 occasions; least, 44, on the 7th. There were 3 fogs.

The following table furnishes a comparison with the 22 preceding Januaries:

| January. | Mean temperature..... | Maximum temperature..... | Minimum temperature..... | Zero days..... | Winter days..... | Rain, inches..... | Snow, inches..... | Hoary days..... | Thunder storms..... | Mean cloudiness..... | Humidity..... | No. of fogs..... | Miles of wind..... | Mean barometer..... | Maximum barometer..... | Minimum barometer..... |
|-----------|-----------------------|--------------------------|--------------------------|----------------|------------------|-------------------|-------------------|-----------------|---------------------|----------------------|---------------|------------------|--------------------|---------------------|------------------------|------------------------|
| 1868..... | 23.47 | 64.0 | -7.0 | 23 | 2 | 0.36 | 5.0 | 1 | 0 | 37.00 | ..... | 0 | ..... | ..... | ..... | ..... |
| 1869..... | 30.38 | 56.0 | 6.0 | 18 | 0 | 0.90 | 4.0 | 8 | 0 | 43.97 | 83.7 | 1 | ..... | 29.101 | 29.390 | 28.616 |
| 1870..... | 28.88 | 56.5 | -1.0 | 20 | 1 | 0.67 | 3.0 | 6 | 0 | 49.25 | 74.2 | 1 | ..... | 29.158 | 29.764 | 28.191 |
| 1871..... | 28.57 | 67.5 | -5.0 | 18 | 3 | 1.11 | 11.0 | 8 | 0 | 64.00 | 75.7 | 2 | ..... | 29.199 | 29.726 | 28.665 |
| 1872..... | 24.17 | 50.5 | -7.5 | 22 | 4 | 0.17 | 1.0 | 1 | 0 | 42.69 | 68.3 | 1 | ..... | 29.238 | 29.697 | 28.810 |
| 1873..... | 18.23 | 46.5 | -26.0 | 24 | 7 | 2.60 | 16.0 | 9 | 0 | 47.10 | 75.5 | 1 | 10,933 | 29.117 | 29.704 | 28.627 |
| 1874..... | 27.77 | 61.0 | -2.5 | 18 | 1 | 2.35 | 7.5 | 8 | 0 | 53.65 | 73.0 | 2 | 13,203 | 29.184 | 29.845 | 28.427 |
| 1875..... | 15.42 | 46.5 | -16.5 | 30 | 10 | 0.12 | 0.0 | 8 | 0 | 54.84 | 83.1 | 0 | 10,679 | 29.363 | 29.856 | 28.793 |
| 1876..... | 34.70 | 65.5 | 2.0 | 13 | 0 | 0.57 | 0.0 | 6 | 0 | 42.17 | 68.4 | 1 | 14,135 | 29.176 | 29.665 | 28.527 |
| 1877..... | 25.60 | 62.5 | -0.0 | 25 | 3 | 1.17 | 8.0 | 8 | 0 | 48.82 | 75.5 | 1 | 9,178 | 29.255 | 29.751 | 28.563 |
| 1878..... | 33.97 | 55.0 | 7.5 | 9 | 0 | 3.05 | 0.0 | 8 | 1 | 46.77 | 73.4 | 0 | 9,960 | 29.144 | 29.618 | 28.835 |
| 1879..... | 23.49 | 53.0 | -16.0 | 20 | 6 | 0.37 | 0.8 | 4 | 0 | 43.98 | 76.0 | 1 | 8,309 | 29.253 | 29.745 | 28.752 |
| 1880..... | 41.23 | 67.0 | 20.5 | 4 | 0 | 1.80 | 0.0 | 3 | 0 | 48.49 | 73.8 | 9 | 12,861 | 29.094 | 29.631 | 28.604 |
| 1881..... | 21.60 | 53.0 | -8.0 | 26 | 4 | 0.34 | 0.5 | 6 | 0 | 58.60 | 75.9 | 1 | 12,192 | 29.255 | 29.722 | 28.713 |
| 1882..... | 32.68 | 65.0 | 5.0 | 10 | 0 | 0.70 | 2.0 | 6 | 0 | 51.72 | 66.2 | 1 | 11,673 | 20.200 | 29.760 | 28.709 |
| 1883..... | 19.65 | 47.0 | -14.0 | 28 | 5 | 0.73 | 5.5 | 7 | 0 | 53.55 | 79.1 | 1 | 12,526 | 29.253 | 29.741 | 28.526 |
| 1884..... | 20.99 | 57.0 | -21.5 | 21 | 7 | 1.28 | 12.0 | 7 | 0 | 41.42 | 73.9 | 3 | 14,368 | 29.313 | 29.881 | 28.735 |
| 1885..... | 18.74 | 55.5 | -12.5 | 24 | 13 | 1.66 | 8.0 | 10 | 0 | 43.76 | 83.0 | 1 | 8,390 | 29.252 | 29.701 | 28.550 |
| 1886..... | 11.32 | 41.5 | -18.0 | 30 | 10 | 2.28 | 12.0 | 15 | 0 | 61.93 | 83.0 | 2 | 13,090 | 29.200 | 29.721 | 28.627 |
| 1887..... | 20.48 | 55.0 | -20.0 | 21 | 9 | 1.23 | 9.0 | 5 | 1 | 43.55 | 73.2 | 0 | 14,680 | 29.094 | 29.769 | 28.467 |
| 1888..... | 17.70 | 54.0 | -18.0 | 24 | 8 | 0.93 | 3.0 | 5 | 1 | 41.29 | 85.0 | 4 | 12,435 | 29.334 | 29.983 | 28.641 |
| 1889..... | 30.31 | 49.0 | 7.0 | 15 | 0 | 0.79 | 0.0 | 2 | 0 | 37.31 | 77.5 | 8 | 11,620 | 29.148 | 29.477 | 28.415 |
| 1890..... | 27.43 | 63.0 | -5.0 | 19 | 1 | 2.50 | 8.0 | 3 | 0 | 57.81 | 81.9 | 3 | 11,580 | 29.242 | 29.783 | 28.652 |
| Mean..... | 25.17 | 56.1 | -6.9 | 20 | 4 | 1.28 | 5.1 | 7 | 0.1 | 48.38 | 76.4 | 2 | 11,771 | 29.202 | 29.724 | 28.611 |

REPORT FOR FEBRUARY.

Although the mean temperature was nearly normal, the month presented many alternations of heat and cold. White maples began to blossom on the 11th (with one exception the earliest date on our record), yet the last four days of the month were the coldest four days of the winter. The rainfall was below the average; the wind velocity was normal; and the cloudiness was excessive.

MEAN TEMPERATURE—32.55 deg., which is 0.69 deg. above the February average. The highest temperature was 65 deg., on the 16th; the lowest was 1.5 deg. below zero, on the 28th, giving a range of 66.5 deg. Mean temperature at 7 A.M., 27.57 deg.; at 2 P.M., 38.73 deg.; at 9 P.M., 31.95 deg.

RAINFALL—including melted snow and sleet—0.75 inch, which is 0.57 inch below the February average. Rain and snow in measurable quantities fell on 7 days. There were 3 inches of snow.

MEAN CLOUDINESS—60.47 per cent. of the sky, the month being 13.29 per cent. cloudier than usual. Number of clear days (less than one-third cloudy), 8; half clear (from one to two-thirds cloudy), 8; cloudy (more than two-thirds), 12. There were 4 entirely clear days and 8 entirely cloudy. Mean cloudiness at 7 A.M., 69.74 per cent.; at 2 P.M., 63.92 per cent.; at 9 P.M., 47.85 per cent.

WIND.—N. W. 22 times, S. W. 17 times, N. 15 times, N. E. 10 times, S. E. 8 times, S. 6 times, E. 3 times, W. once. The total run of the wind was 10,924 miles, which is 92 miles below the February average. This gives a mean daily velocity of 390 miles and a mean hourly velocity of 16.25 miles. The highest velocity was 54 miles an hour, from 12:20 to 12:30 A.M. on the 25th.

BAROMETER.—Mean for the month, 29.156 inches; at 7 A.M., 29.169 inches; at 2 P.M., 29.139 inches; at 9 P.M., 29.159 inches; maximum, 29.681 inches, on the 23d; minimum, 28.679 inches, on the 25th; monthly range, 1.378 inches.

RELATIVE HUMIDITY.—Mean for the month, 79.0; at 7 A.M., 90.1; at 2 P.M., 64.1; at 9 P.M., 82.7; greatest, 100, on several occasions; least, 38.5, on the 10th. There were 3 fogs.

The following table furnishes a comparison with the 22 preceding Februaries:

| February. | Mean temperature... | Maximum temperature... | Minimum temperature... | Zero days..... | Winter days..... | Rain, inches..... | Snow, inches..... | Rating days..... | Thunder storms. | Mean cloudiness..... | Humidity..... | No. of fogs..... | Miles of wind... | Mean barometer.... | Maximum barometer.... | Minimum barometer.... |
|-----------|---------------------|------------------------|------------------------|----------------|------------------|-------------------|-------------------|------------------|-----------------|----------------------|---------------|------------------|------------------|--------------------|-----------------------|-----------------------|
| 1868..... | 35.30 | 72.0 | -3.0 | 13 | 1 | 0.19 | 0.50 | 3 | 1 | 24.71 | ..... | 0 | ..... | ..... | ..... | ..... |
| 1869..... | 30.32 | 66.0 | -5.0 | 15 | 1 | 1.44 | 5.25 | 6 | 1 | 51.20 | 83.1 | 1 | ..... | 29.097 | 29.633 | 28.636 |
| 1870..... | 34.88 | 69.0 | -1.0 | 9 | 1 | 0.03 | 0.00 | 2 | 0 | 43.69 | 61.6 | 2 | ..... | 29.017 | 29.572 | 28.337 |
| 1871..... | 35.03 | 71.5 | -6.0 | 9 | 1 | 2.43 | 4.00 | 8 | 2 | 49.85 | 74.3 | 3 | ..... | 29.039 | 29.610 | 28.333 |
| 1872..... | 30.08 | 62.0 | -12.0 | 10 | 3 | 0.82 | 7.75 | 5 | 0 | 54.91 | 70.4 | 3 | ..... | 29.048 | 29.588 | 28.419 |
| 1873..... | 29.98 | 62.0 | -6.5 | 13 | 2 | 0.86 | 3.00 | 3 | 1 | 45.95 | 68.1 | 1 | 12,827 | 29.162 | 29.727 | 28.575 |
| 1874..... | 27.26 | 49.0 | 2.0 | 16 | 0 | 0.95 | 10.0 | 8 | 1 | 60.94 | 78.2 | 4 | 9,195 | 29.166 | 29.699 | 28.300 |
| 1875..... | 21.92 | 55.0 | -8.0 | 23 | 3 | 0.80 | 4.00 | 7 | 1 | 50.48 | 74.7 | 1 | 11,365 | 29.174 | 29.694 | 28.524 |
| 1876..... | 37.80 | 74.5 | -5.0 | 12 | 1 | 0.36 | 0.25 | 3 | 1 | 38.16 | 59.0 | 1 | 15,236 | 29.135 | 29.667 | 28.570 |
| 1877..... | 39.65 | 66.0 | 21.0 | 1 | 0 | 0.80 | 2.00 | 5 | 0 | 47.13 | 71.2 | 2 | 7,718 | 29.301 | 29.621 | 28.826 |
| 1878..... | 40.22 | 66.0 | 15.5 | 4 | 0 | 2.86 | 2.50 | 9 | 1 | 54.63 | 78.5 | 0 | 7,393 | 29.016 | 29.498 | 28.575 |
| 1879..... | 31.06 | 74.0 | 5.0 | 9 | 0 | 0.41 | 4.50 | 2 | 0 | 39.04 | 61.7 | 0 | 10,097 | 29.199 | 29.621 | 28.609 |
| 1880..... | 37.58 | 64.0 | 8.0 | 11 | 0 | 0.73 | 0.00 | 3 | 1 | 24.94 | 64.5 | 0 | 11,861 | 29.125 | 29.733 | 28.473 |
| 1881..... | 25.78 | 61.5 | -5.5 | 18 | 0 | 4.60 | 22.0 | 7 | 0 | 54.17 | 79.8 | 3 | 12,142 | 29.180 | 29.571 | 28.606 |
| 1882..... | 41.65 | 73.0 | 12.0 | 4 | 0 | 1.66 | 2.00 | 6 | 0 | 45.49 | 69.7 | 3 | 11,907 | 29.110 | 29.441 | 28.581 |
| 1883..... | 27.92 | 67.0 | -13.0 | 13 | 3 | 2.31 | 4.00 | 9 | 1 | 51.67 | 77.9 | 2 | 10,593 | 29.340 | 29.869 | 28.492 |
| 1884..... | 28.03 | 57.0 | -1.0 | 16 | 1 | 1.13 | 2.00 | 8 | 1 | 54.33 | 72.3 | 1 | 11,742 | 29.158 | 29.469 | 28.587 |
| 1885..... | 20.83 | 55.0 | -14.5 | 20 | 7 | 1.12 | 11.0 | 7 | 0 | 47.86 | 75.1 | 0 | 10,907 | 29.148 | 29.562 | 28.556 |
| 1886..... | 31.64 | 62.0 | -7.0 | 10 | 3 | 0.56 | 1.00 | 7 | 1 | 42.38 | 73.6 | 2 | 11,170 | 29.166 | 29.725 | 28.482 |
| 1887..... | 30.43 | 68.0 | -5.5 | 16 | 3 | 1.58 | 6.00 | 11 | 1 | 57.86 | 82.6 | 4 | 11,815 | 29.205 | 29.792 | 28.152 |
| 1888..... | 32.74 | 57.0 | -1.0 | 12 | 1 | 1.27 | 2.00 | 7 | 0 | 50.68 | 78.2 | 6 | 12,250 | 29.143 | 29.851 | 28.621 |
| 1889..... | 27.56 | 65.0 | -3.5 | 13 | 4 | 2.20 | 6.00 | 6 | 0 | 51.78 | 76.0 | 3 | 11,020 | 29.244 | 29.948 | 28.570 |
| 1890..... | 32.55 | 65.0 | -1.5 | 10 | 1 | 0.75 | 3.00 | 7 | 0 | 60.47 | 79.0 | 3 | 10,924 | 29.156 | 29.681 | 28.679 |
| Mean ... | 31.89 | 64.3 | -1.1 | 12 | 2 | 1.29 | 4.35 | 6 | 1 | 47.75 | 73.3 | 2 | 11,011 | 29.149 | 29.662 | 28.520 |

REPORT FOR MARCH.

The month was cold, dry, and windy. Six preceding Marches have been colder, but in no other March on our record, except in 1876, has good ice been cut upon the Kansas river. Unusual wind storms prevailed on the 24th and 27th, the barometer on the latter date reaching the lowest reading ever observed at this station. The rainfall was less than half the average amount, but the total precipitation for the first quarter of 1890 falls but little below the normal.

MEAN TEMPERATURE—37.79 degrees, which is 3.83 deg. below the March average. The highest temperature was 76 deg., on the 24th; the lowest was 4 deg., on the 1st, giving a range of 72 deg. Mean temperature at 7 A. M., 30.80 deg.; at 2 P. M., 46.0 deg.; at 9 P. M., 37.18 deg.

RAINFALL—Including melted snow and sleet—1.02 inches, which is 1.28 inches below the March average. Rain and snow in measurable quantities fell on 8 days. Snow fell on 4 days, but the entire depth was only half an inch. There was one thunder shower. The entire rainfall for the 3 months of 1890 now completed has been 4.27 inches, which is 0.58 inch below the average for the same months in the preceding 22 years.

MEAN CLOUDINESS—54.23 per cent. of the sky, the month being 12.88 per cent. cloudier than usual. Number of clear days (less than one-third cloudy), 11; half-clear (from one to two-thirds cloudy), 10; cloudy (more than two-thirds), 10. There were 3 entirely clear days, and 7 entirely cloudy. Mean cloudiness at 7 A. M., 52.4 per cent.; at 2 P. M., 60.30 per cent.; at 9 P. M., 50 per cent.

WIND.—N. W. 25 times, N. E. 18 times, N. 12 times, S. E. 11 times, S. W. 11 times, E. 9 times, S. 5 times, W. 2 times. The total run of the wind was 13,580 miles, which is 504 miles below the March average. This gives a mean daily velocity of 438.06 miles and a mean hourly velocity of 18.25 miles. The highest velocity was 66 miles an hour, from 2:35 to 3:05 P. M., and 7:30 to 7:35 P. M., on the 27th.

BAROMETER.—Mean for the month, 29.140 inches; at 7 A. M., 29.159 inches; at 2

P. M., 29.115 inches; at 9 P. M., 29.146 inches; maximum, 29.666 inches, on the 15th; minimum, 28.058 inches, on the 27th; monthly range, 1.608 inches.

RELATIVE HUMIDITY.—Mean for the month, 70.8; at 7 A. M., 81.5; at 2 P. M., 56.5; at 9 P. M., 74.6; greatest, 100, on 10 occasions; least, 38, on the 16th. There were 5 fogs.

The following table furnishes a comparison with the 22 preceding Marches:

| March. | Mean temperature... | Maximum temperature... | Minimum temperature... | Winter days..... | Rain, inches..... | Snow, inches..... | Wet days..... | Thunder storms..... | Cloudiness..... | Humidity..... | No. of fogs..... | Miles of wind..... | Mean barometer..... | Maximum barometer..... | Minimum barometer..... |
|-----------|---------------------|------------------------|------------------------|------------------|-------------------|-------------------|---------------|---------------------|-----------------|---------------|------------------|--------------------|---------------------|------------------------|------------------------|
| 1868..... | 51.15 | 93.0 | 22.0 | 1 | 3.46 | 0.00 | 4 | 0 | 51.18 | ..... | 0 | ..... | ..... | 29.684 | 28.507 |
| 1869..... | 34.53 | 81.0 | -1.0 | 9 | 1.15 | 1.00 | 4 | 0 | 52.81 | 75.4 | 3 | ..... | 29.146 | 29.684 | 28.507 |
| 1870..... | 37.25 | 71.0 | 1.0 | 8 | 1.86 | 0.00 | 7 | 3 | 56.13 | 64.0 | 0 | ..... | 29.063 | 29.610 | 28.397 |
| 1871..... | 47.10 | 78.0 | 25.5 | 0 | 1.73 | 4.00 | 6 | 3 | 52.00 | 60.4 | 0 | ..... | 28.943 | 29.307 | 28.404 |
| 1872..... | 36.79 | 72.0 | 18.0 | 9 | 2.92 | 3.50 | 6 | 4 | 55.06 | 63.8 | 0 | ..... | 29.124 | 29.731 | 28.423 |
| 1873..... | 42.33 | 74.0 | 4.0 | 5 | 1.34 | 2.00 | 5 | 1 | 41.93 | 52.8 | 0 | 18,147 | 29.118 | 29.655 | 28.620 |
| 1874..... | 39.13 | 69.5 | 19.0 | 4 | 2.30 | 4.00 | 7 | 1 | 62.27 | 67.1 | 1 | 13,419 | 29.123 | 29.678 | 28.493 |
| 1875..... | 37.10 | 82.0 | 9.5 | 13 | 2.61 | 1.00 | 7 | 1 | 44.84 | 64.9 | 0 | 15,023 | 29.051 | 29.471 | 28.530 |
| 1876..... | 34.25 | 66.0 | 0.0 | 11 | 4.51 | 17.0 | 11 | 0 | 60.45 | 69.4 | 1 | 15,690 | 29.060 | 29.633 | 28.586 |
| 1877..... | 40.03 | 81.0 | 7.0 | 6 | 3.40 | 5.00 | 7 | 2 | 54.09 | 56.2 | 1 | 13,981 | 29.108 | 29.537 | 28.553 |
| 1878..... | 50.90 | 81.0 | 27.0 | 0 | 2.67 | 0.00 | 8 | 1 | 40.36 | 67.6 | 0 | 11,994 | 29.005 | 29.372 | 28.519 |
| 1879..... | 48.22 | 87.0 | 11.0 | 7 | 0.37 | 0.00 | 5 | 0 | 46.02 | 56.1 | 0 | 13,787 | 29.165 | 29.662 | 28.760 |
| 1880..... | 42.38 | 79.0 | 2.5 | 6 | 2.03 | 3.00 | 5 | 2 | 44.94 | 63.4 | 1 | 13,841 | 29.133 | 29.591 | 28.478 |
| 1881..... | 37.47 | 77.0 | 14.0 | 6 | 1.68 | 8.00 | 7 | 1 | 45.79 | 70.3 | 0 | 16,231 | 29.043 | 29.460 | 28.305 |
| 1882..... | 46.90 | 79.0 | 17.0 | 3 | 1.62 | 9.00 | 5 | 1 | 40.22 | 64.9 | 0 | 16,603 | 29.126 | 29.676 | 28.549 |
| 1883..... | 40.90 | 69.0 | 16.0 | 3 | 1.28 | 0.00 | 7 | 1 | 48.92 | 65.5 | 0 | 12,080 | 29.164 | 29.774 | 28.630 |
| 1884..... | 41.56 | 73.0 | 12.0 | 7 | 2.48 | 1.00 | 9 | 5 | 58.87 | 65.0 | 2 | 14,229 | 29.054 | 29.465 | 28.451 |
| 1885..... | 40.55 | 73.0 | 15.0 | 6 | 0.87 | 4.00 | 5 | 0 | 40.61 | 65.8 | 0 | 12,184 | 29.205 | 29.514 | 28.757 |
| 1886..... | 40.40 | 79.0 | 11.0 | 6 | 1.63 | 4.00 | 10 | 1 | 55.05 | 67.7 | 0 | 13,900 | 29.069 | 29.510 | 28.589 |
| 1887..... | 43.41 | 81.0 | 22.0 | 3 | 2.75 | 6.00 | 8 | 2 | 38.50 | 63.8 | 2 | 13,360 | 29.147 | 29.521 | 28.579 |
| 1888..... | 38.63 | 78.0 | 14.0 | 12 | 5.47 | 2.00 | 10 | 4 | 53.87 | 73.0 | 0 | 13,820 | 29.140 | 29.696 | 28.495 |
| 1889..... | 44.73 | 71.0 | 22.0 | 2 | 2.30 | 0.00 | 7 | 2 | 42.80 | 69.3 | 1 | 11,110 | 29.127 | 29.539 | 28.600 |
| 1890..... | 37.79 | 76.0 | 4.0 | 9 | 1.02 | 0.50 | 8 | 1 | 54.23 | 70.9 | 5 | 13,580 | 29.140 | 29.666 | 28.058 |
| Mean..... | 41.46 | 77.0 | 12.7 | 6 | 1.28 | 3.26 | 7 | 2 | 41.98 | 65.8 | 1 | 14,056 | 29.102 | 29.575 | 28.578 |

REPORT FOR APRIL.

The month was warm and cloudy, with frequent rainfall, although the total precipitation was slightly below the average. The hard frost of the 1st did no damage to fruit buds. The last light frost of spring occurred on the 10th. The wind velocity was a little above the normal. A few snow flakes appeared on the 2d. The weather throughout the month was highly favorable to crops.

MEAN TEMPERATURE—56.62 degrees, which is 2.34 deg. above the April average. The highest temperature was 89 deg., on the 30th; the lowest was 29 deg., on the 1st, giving a range of 60 deg. Mean temperature at 7 A. M., 50.62 deg.; at 2 P. M., 64.71 deg.; at 9 P. M., 55.57 deg.

RAINFALL—2.51 inches, which is 0.62 inch below the April average. Rain fell in measurable quantities on 9 days. There were 3 thunder showers. The entire rainfall for the four months of 1890 now completed has been 6.78 inches, which is 1.28 inches below the average for the same months in the preceding 22 years.

MEAN CLOUDINESS—52.94 per cent. of the sky, the month being 5.06 per cent. cloudier than usual. Number of clear days (less than one-third cloudy), 12; half-clear (from one- to two-thirds cloudy) 6; cloudy (more than two-thirds), 12. There were 2 entirely clear days and 7 entirely cloudy. Mean cloudiness at 7 A. M., 57.66 per cent.; at 2 P. M., 58.66 per cent.; at 9 P. M., 42.50 per cent.

WIND.—N. E. 17 times, N. 15 times, S. 14 times, N. W. 13 times, S. E. 11 times, S. W. 11 times, E. 5 times, W. 4 times. The total run of the wind was 13,979 miles, which is 209 miles above the April average. This gives a mean daily velocity of 466

miles, and a mean hourly velocity of 19.42 miles. The highest velocity was 60 miles an hour, from 2 to 4 P.M. on the 11th.

BAROMETER.—Mean for the month, 29.110 inches; at 7 A.M., 29.133 inches; at 2 P.M., 29.097 inches; at 9 P.M., 29.099 inches; maximum, 29.494 inches, on the 1st; minimum, 28.581 inches, on the 8th; monthly range, 0.913 inch.

RELATIVE HUMIDITY.—Mean for the month, 69.4; at 7 A.M., 82.9; at 2 P.M., 52.7; at 9 P.M., 72.5; greatest, 100, on 3 occasions; least, 14, on the 11th. There was one fog.

The following table furnishes a comparison with the 22 preceding Aprils:

| April. | Mean temperature... | Maximum temperature... | Minimum temperature... | Rain, inches..... | Snow, inches.... | Rainy days..... | Thunder-storms.. | Mean cloudiness..... | Humidity..... | No. of fogs..... | Miles of wind... | Mean barometer..... | Maximum barometer.... | Minimum barometer..... |
|-----------|---------------------|------------------------|------------------------|-------------------|------------------|-----------------|------------------|----------------------|---------------|------------------|------------------|---------------------|-----------------------|------------------------|
| 1868..... | 49.14° | 83.0° | 25.6° | 2.95 | 0.00 | 10 | 3 | 52.00 | ..... | 1 | ..... | ..... | ..... | ..... |
| 1869..... | 50.97 | 87.0 | 18.0 | 2.43 | 1.00 | 10 | 2 | 51.00 | 75.1 | 0 | ..... | 29.006 | 29.407 | 28.385 |
| 1870..... | 56.20 | 91.0 | 19.0 | 1.08 | 0.00 | 8 | 1 | 49.33 | 54.7 | 1 | ..... | 29.081 | 29.359 | 28.700 |
| 1871..... | 57.30 | 92.0 | 30.5 | 2.38 | 0.00 | 8 | 3 | 47.11 | 53.5 | 0 | ..... | 28.861 | 29.331 | 28.299 |
| 1872..... | 55.92 | 85.0 | 30.0 | 4.74 | 0.00 | 12 | 7 | 55.12 | 56.5 | 1 | ..... | 28.999 | 29.443 | 28.401 |
| 1873..... | 48.71 | 88.0 | 26.0 | 4.42 | 2.00 | 9 | 2 | 55.89 | 68.4 | 0 | 18,371 | 28.957 | 29.349 | 28.533 |
| 1874..... | 47.69 | 83.0 | 22.5 | 2.86 | 0.00 | 8 | 2 | 51.11 | 57.7 | 0 | 14,784 | 29.100 | 29.422 | 28.633 |
| 1875..... | 49.70 | 82.0 | 23.0 | 2.54 | 0.00 | 10 | 2 | 48.22 | 57.6 | 0 | 14,144 | 29.075 | 29.395 | 28.676 |
| 1876..... | 55.60 | 87.5 | 30.0 | 3.38 | 0.00 | 7 | 5 | 44.78 | 56.6 | 0 | 14,442 | 29.055 | 29.418 | 28.684 |
| 1877..... | 53.99 | 81.0 | 25.0 | 3.13 | 0.00 | 11 | 4 | 53.00 | 74.9 | 1 | 11,970 | 28.995 | 29.597 | 28.364 |
| 1878..... | 58.60 | 82.0 | 36.0 | 5.48 | 0.00 | 7 | 5 | 38.22 | 66.0 | 1 | 11,482 | 28.851 | 29.242 | 28.335 |
| 1879..... | 56.49 | 84.0 | 29.0 | 4.18 | 0.00 | 10 | 6 | 49.67 | 61.0 | 0 | 11,231 | 29.062 | 29.467 | 28.684 |
| 1880..... | 56.92 | 93.0 | 31.0 | 1.75 | 0.06 | 6 | 4 | 34.56 | 53.4 | 0 | 16,709 | 29.029 | 29.550 | 28.303 |
| 1881..... | 52.47 | 84.0 | 13.0 | 1.27 | 0.00 | 9 | 4 | 51.78 | 67.6 | 0 | 14,495 | 29.084 | 29.501 | 28.622 |
| 1882..... | 56.83 | 88.0 | 35.0 | 3.20 | 0.00 | 9 | 5 | 51.77 | 61.7 | 0 | 14,226 | 29.032 | 29.484 | 28.542 |
| 1883..... | 57.18 | 89.5 | 30.5 | 2.12 | 0.00 | 8 | 2 | 49.11 | 53.3 | 2 | 12,936 | 28.957 | 29.473 | 28.289 |
| 1884..... | 50.42 | 76.5 | 28.5 | 5.62 | 6.00 | 13 | 4 | 58.76 | 65.9 | 1 | 13,334 | 29.002 | 29.321 | 28.495 |
| 1885..... | 53.88 | 75.0 | 30.0 | 5.72 | 0.00 | 11 | 6 | 59.33 | 68.8 | 0 | 13,672 | 29.042 | 29.459 | 28.641 |
| 1886..... | 54.80 | 85.0 | 19.0 | 1.38 | 4.00 | 12 | 2 | 52.63 | 65.1 | 1 | 13,040 | 29.053 | 29.427 | 28.640 |
| 1887..... | 57.66 | 87.0 | 25.0 | 3.33 | 0.00 | 7 | 2 | 30.78 | 61.1 | 0 | 13,232 | 29.614 | 29.437 | 28.601 |
| 1888..... | 57.55 | 88.0 | 31.0 | 2.58 | 0.00 | 5 | 1 | 37.00 | 61.8 | 0 | 12,860 | 29.172 | 29.678 | 28.693 |
| 1889..... | 56.37 | 86.0 | 35.0 | 2.52 | 0.00 | 8 | 5 | 44.16 | 69.3 | 0 | 11,550 | 29.095 | 29.496 | 28.551 |
| 1890..... | 56.62 | 89.0 | 29.0 | 2.51 | 0.00 | 9 | 3 | 52.94 | 68.9 | 1 | 13,979 | 29.110 | 29.494 | 28.581 |
| Mean.... | 54.38 | 85.4 | 26.9 | 3.10 | 0.56 | 9 | 4 | 48.10 | 69.4 | 1 | 13,782 | 29.029 | 29.437 | 28.528 |

REPORT FOR MAY.

A cool, delightful month, with ample rainfall, although the cloudiness was 5 per cent. below the average. The wind velocity was slightly above the normal. A heavy hoar frost on the 6th did very little damage to strawberries and garden vegetables.

MEAN TEMPERATURE—63.23 degrees, which is 2.03 deg. below the May average. The highest temperature was 89 deg., on the 29th; the lowest was 39 deg., on the 6th, giving a range of 60 deg. Mean temperature at 7 A.M., 58.63 deg.; at 2 P.M., 71.52 deg.; at 9 P.M., 61.39 deg.

RAINFALL—5.14 inches, which is .90 inch above the May average. Rainfall in measurable quantities on 12 days. There were 6 thunder showers. The entire rainfall for the 5 months of 1890, now completed, has been 11.92 inches, which is .38 inch below the average for the same months in the preceding 22 years.

MEAN CLOUDINESS—42.42 per cent. of the sky, the month being 5 per cent. clearer than usual. Number of clear days (less than one-third cloudy), 13; half-clear (from one to two-thirds cloudy), 10; cloudy (more than two-thirds), 8. There were 3 entirely clear days, and none entirely cloudy. Mean cloudiness at 7 A.M., 54.52 per cent.; at 2 P.M., 39.84 per cent.; at 9 P.M., 32.90 per cent.

WIND.—S. 16 times, N. W. 16 times, N. 14 times, S. E. 14 times, S. W. 14 times, W. 8 times, N. E. 8 times, E. 3 times. The total run of the wind was 12,057 miles,

which is 259 miles below the May average. This gives a mean daily velocity of 388.93 miles, and a mean hourly velocity of 16.20 miles. The highest velocity was 45 miles an hour, from 2 to 3 P.M. on the 12th.

BAROMETER.—Mean for the month, 29.002 inches; at 7 A.M., 29.055 inches; at 2 P.M., 28.974 inches; at 9 P.M., 28.977 inches; maximum, 29.300 inches, on the 7th; minimum, 28.662 inches, on the 9th; monthly range, .638 inch.

RELATIVE HUMIDITY.—Mean for the month, 68.9; at 7 A.M., 77.7; at 2 P.M., 61.4; at 9 P.M., 75; greatest, 98, on the 30th; least, 22, on the 2d. There was no fog.

The following table furnishes a comparison with the 22 preceding Mays:

| May. | Mean temperature..... | Maximum temperature..... | Minimum temperature..... | Hot days..... | Rain, inches..... | Rainy days..... | Thunder storms..... | Mean cloudiness..... | Foggy days..... | Miles of wind..... | Mean barometer..... | Maximum barometer..... | Minimum barometer..... |
|-----------|-----------------------|--------------------------|--------------------------|---------------|-------------------|-----------------|---------------------|----------------------|-----------------|--------------------|---------------------|------------------------|------------------------|
| 1868..... | 65.90° | 84.0° | 49.0° | 0 | 2.81 | 5 | 1 | 29.62 | 0 | ..... | ..... | ..... | ..... |
| 1869..... | 61.74 | 88.0 | 35.0 | 0 | 3.64 | 12 | 6 | 46.01 | 72.6 | 0 | 28.974 | 29.336 | 28.681 |
| 1870..... | 67.01 | 90.0 | 44.0 | 1 | 2.46 | 7 | 3 | 43.87 | 60.5 | 0 | 29.005 | 29.267 | 28.589 |
| 1871..... | 65.87 | 92.0 | 37.0 | 1 | 2.78 | 8 | 2 | 45.70 | 64.7 | 0 | 29.030 | 29.407 | 28.695 |
| 1872..... | 65.33 | 88.0 | 39.0 | 0 | 5.72 | 14 | 6 | 55.27 | 65.1 | 0 | 29.051 | 29.428 | 28.778 |
| 1873..... | 63.95 | 88.5 | 46.0 | 0 | 7.12 | 11 | 4 | 55.81 | 68.7 | 0 | 12.880 | 28.947 | 29.291 |
| 1874..... | 68.89 | 95.0 | 45.0 | 4 | 1.41 | 6 | 0 | 44.94 | 55.6 | 0 | 12.705 | 29.027 | 29.278 |
| 1875..... | 65.00 | 95.0 | 30.0 | 1 | 3.39 | 11 | 3 | 45.00 | 60.3 | 1 | 12.439 | 29.006 | 29.391 |
| 1876..... | 65.00 | 89.0 | 39.0 | 0 | 6.75 | 11 | 5 | 53.44 | 64.5 | 0 | 13.321 | 29.030 | 28.574 |
| 1877..... | 64.50 | 85.0 | 37.0 | 0 | 6.45 | 17 | 6 | 62.93 | 72.0 | 0 | 11.522 | 29.015 | 28.657 |
| 1878..... | 62.60 | 85.0 | 38.5 | 0 | 5.66 | 16 | 9 | 52.90 | 70.9 | 0 | 12.257 | 29.002 | 28.643 |
| 1879..... | 69.50 | 93.0 | 43.0 | 5 | 1.60 | 4 | 3 | 37.20 | 60.9 | 0 | 12.057 | 29.024 | 29.339 |
| 1880..... | 70.59 | 95.0 | 52.0 | 7 | 4.11 | 8 | 6 | 40.43 | 62.6 | 0 | 14.108 | 29.019 | 28.688 |
| 1881..... | 69.86 | 88.5 | 48.0 | 0 | 3.51 | 17 | 4 | 64.04 | 72.5 | 2 | 8.868 | 29.038 | 29.334 |
| 1882..... | 60.27 | 90.0 | 36.5 | 1 | 3.53 | 10 | 2 | 63.44 | 66.4 | 1 | 13.010 | 29.024 | 28.564 |
| 1883..... | 62.05 | 91.0 | 39.0 | 1 | 7.63 | 10 | 5 | 47.63 | 64.5 | 0 | 15.661 | 29.010 | 28.496 |
| 1884..... | 62.24 | 85.0 | 36.0 | 0 | 3.57 | 12 | 2 | 50.54 | 68.9 | 2 | 9.971 | 29.046 | 28.689 |
| 1885..... | 62.79 | 86.0 | 35.0 | 0 | 4.07 | 11 | 6 | 34.07 | 68.3 | 1 | 9.280 | 29.024 | 29.340 |
| 1886..... | 68.50 | 91.0 | 44.0 | 2 | 5.72 | 9 | 6 | 34.52 | 67.9 | 0 | 7.920 | 29.024 | 28.620 |
| 1887..... | 67.88 | 91.5 | 45.5 | 1 | 1.12 | 7 | 3 | 40.32 | 70.4 | 1 | 10.270 | 29.041 | 29.407 |
| 1888..... | 62.08 | 83.0 | 38.0 | 0 | 1.97 | 8 | 5 | 47.09 | 65.3 | 0 | 10.956 | 28.958 | 29.302 |
| 1889..... | 64.23 | 89.0 | 38.0 | 0 | 8.27 | 14 | 8 | 48.47 | 68.9 | 0 | 13.350 | 29.020 | 29.394 |
| 1890..... | 63.23 | 89.0 | 39.0 | 0 | 5.14 | 12 | 6 | 42.42 | 68.9 | 0 | 12.057 | 29.002 | 28.662 |
| Mean..... | 65.17 | 89.2 | 40.6 | 1 | 4.28 | 10 | 4 | 47.20 | 66.5 | 0 | 11,812 | 29.015 | 29.302 |

REPORT FOR JUNE.

The hottest June on our 23 years' record, except June, 1881, which surpassed it by only 0.23 degree of mean temperature. The rainfall was deficient, being less than half the average amount, and the smallest June precipitation on our record since 1872. The rain, however, was well distributed, and crops have suffered no damage from the present deficiency. The cloudiness was below average, and the wind velocity above the normal by nearly a thousand miles.

MEAN TEMPERATURE—77.02 degrees, which is 3.80 deg. above the June average. The highest temperature was 96 deg., on the 28th; the lowest was 52 deg., on the 6th, giving a range of 44 deg. Mean temperature at 7 A.M., 72.80 deg.; at 2 P.M., 85.12 deg.; at 9 P.M., 75.08 deg.

RAINFALL—2.12 inches, which is 2.78 inches below the June average. Rain fell in measurable quantities on 6 days. There were 2 thunder showers. The entire rainfall for the 6 months of 1890 now completed has been 14.04 inches, which is 3.09 inches below the average for the same months in the preceding 22 years.

MEAN CLOUDINESS—34.72 per cent. of the sky, the month being 6.87 per cent. clearer than usual. Number of clear days (less than one-third cloudy), 16; half-clear (from one to two-thirds cloudy), 10; cloudy (more than two-thirds), 4. There

were 2 entirely clear days, and none entirely cloudy. Mean cloudiness at 7 A.M., 39.33 per cent.; at 2 P.M., 39.33 per cent.; at 9 P.M., 25.50 per cent.

WIND.—S. W. 26 times, S. E. 22 times, N. W. 9 times, N. E. 4 times, E. 2 times, N. 2 times, W. once. The total run of the wind was 10,737 miles, which is 944 miles above the June average. This gives a mean daily velocity of 358 miles, and a mean hourly velocity of 14.91 miles. The highest velocity was 40 miles an hour, on the 10th, 13th, and 23d.

BAROMETER.—Mean for the month, 29.039 inches; at 7 A.M., 29.052 inches; at 2 P.M., 29.048 inches; at 9 P.M., 29.018 inches; maximum, 29.387 inches, on the 8th; minimum, 28.715 inches, on the 2d; monthly range, 0.672 inch.

The following table furnishes a comparison with the 22 preceding Junes.

| June. | Mean temperature... | Maximum temperature... | Minimum temperature... | Hot days..... | Rain, inches..... | Wet days..... | Thunder showers..... | Mean cloudiness..... | Humidity..... | No. of fogs..... | Miles of wind..... | Mean barometer..... | Maximum barometer..... | Minimum barometer..... |
|-----------|------------------------|---------------------------|---------------------------|---------------|----------------------|---------------|-------------------------|-------------------------|---------------|------------------|--------------------|------------------------|---------------------------|---------------------------|
| 1868..... | 74.150 | 99.00 | 57.00 | 11 | 3.80 | 6 | 3 | 41.71 | ..... | 0 | ..... | 29.075 | 29.355 | 28.748 |
| 1869..... | 68.80 | 99.0 | 37.0 | 1 | 7.57 | 15 | 10 | 56.74 | 77.0 | 1 | ..... | 29.082 | 29.265 | 28.829 |
| 1870..... | 72.59 | 102.0 | 44.0 | 12 | 1.88 | 13 | 6 | 39.44 | 68.0 | 1 | ..... | 29.038 | 29.305 | 28.857 |
| 1871..... | 75.87 | 96.0 | 53.0 | 12 | 4.06 | 10 | 5 | 46.33 | 66.9 | 0 | ..... | 29.040 | 29.197 | 28.633 |
| 1872..... | 76.14 | 97.0 | 53.0 | 14 | 1.30 | 14 | 6 | 35.33 | 61.4 | 0 | ..... | 29.033 | 29.426 | 28.770 |
| 1873..... | 75.89 | 97.0 | 58.0 | 9 | 2.96 | 11 | 3 | 41.66 | 68.0 | 0 | 9,445 | 29.027 | 29.234 | 28.718 |
| 1874..... | 76.50 | 95.0 | 53.5 | 9 | 3.58 | 7 | 3 | 34.70 | 66.0 | 0 | 10,241 | 29.028 | 29.246 | 28.598 |
| 1875..... | 75.47 | 99.0 | 49.0 | 13 | 3.45 | 7 | 3 | 31.44 | 60.2 | 0 | 12,847 | 29.010 | 29.336 | 28.733 |
| 1876..... | 70.24 | 98.0 | 50.0 | 8 | 12.11 | 11 | 4 | 68.60 | 65.6 | 0 | 12,371 | 29.011 | 29.251 | 28.683 |
| 1877..... | 72.03 | 95.0 | 47.0 | 4 | 7.20 | 14 | 9 | 38.78 | 75.3 | 0 | 8,741 | 29.032 | 29.201 | 28.787 |
| 1878..... | 69.79 | 89.0 | 50.0 | 0 | 5.67 | 10 | 6 | 48.66 | 74.8 | 0 | 9,187 | 29.040 | 29.294 | 28.675 |
| 1879..... | 73.22 | 97.0 | 45.0 | 12 | 7.14 | 10 | 9 | 41.33 | 69.9 | 0 | 9,498 | 29.041 | 29.417 | 28.538 |
| 1880..... | 73.57 | 96.0 | 50.5 | 8 | 4.10 | 9 | 5 | 37.44 | 68.1 | 0 | 12,629 | 29.065 | 29.351 | 28.707 |
| 1881..... | 77.25 | 97.0 | 62.5 | 14 | 4.52 | 13 | 10 | 31.89 | 70.1 | 0 | 11,474 | 29.065 | 29.270 | 28.749 |
| 1882..... | 74.14 | 99.0 | 41.5 | 11 | 4.72 | 11 | 5 | 38.99 | 69.9 | 0 | 10,878 | 29.065 | 29.316 | 28.804 |
| 1883..... | 71.38 | 94.0 | 48.5 | 6 | 7.73 | 14 | 7 | 38.56 | 74.3 | 0 | 10,737 | 29.043 | 29.437 | 28.850 |
| 1884..... | 71.07 | 92.0 | 48.6 | 2 | 3.84 | 12 | 7 | 38.78 | 71.8 | 1 | 6,806 | 29.052 | 29.280 | 28.713 |
| 1885..... | 72.57 | 92.0 | 51.0 | 3 | 2.39 | 12 | 5 | 47.30 | 72.3 | 0 | 9,883 | 29.061 | 29.269 | 28.664 |
| 1886..... | 71.85 | 92.0 | 49.0 | 3 | 3.71 | 12 | 3 | 38.00 | 68.4 | 0 | 6,372 | 29.039 | 29.401 | 28.715 |
| 1887..... | 73.89 | 96.0 | 51.0 | 5 | 3.77 | 8 | 2 | 34.33 | 73.1 | 0 | 8,170 | 29.038 | 29.280 | 28.713 |
| 1888..... | 73.10 | 94.0 | 52.0 | 6 | 8.31 | 12 | 11 | 45.22 | 70.2 | 0 | 10,380 | 29.039 | 29.401 | 28.715 |
| 1889..... | 71.24 | 96.0 | 51.5 | 1 | 4.05 | 7 | 7 | 39.56 | 73.3 | 2 | 6,860 | 29.039 | 29.401 | 28.715 |
| 1890..... | 77.02 | 96.0 | 52.0 | 14 | 2.12 | 6 | 2 | 34.72 | ..... | 0 | 10,737 | 29.039 | 29.401 | 28.715 |
| Mean ... | 73.39 | 95.2 | 50.3 | 8 | 4.77 | 11 | 6 | 41.28 | 69.9 | 0 | 9,848 | 29.034 | 29.387 | 28.723 |

REPORT FOR JULY.

Only two Julys of the past twenty-three years have been warmer than this (in 1868 and 1874). On two-thirds of the days of the month the mercury reached 90 deg. The rainfall is 2.67 inches below the average, but two Julys in the twenty-three years (in 1874, 1.19 in., and 1886, 0.11 in.) showing less rain. But one fair rain, that of 15th, 1.25 in., was had during the month. The wind velocity was above the average.

RAINFALL.—1.565 inches, which is 2.67 inches below the July average. Rain fell on five days. There were three thunder showers. Of the total rainfall for the month, 1.25 inches fell on the 15th.

MEAN TEMPERATURE.—80.546 degrees, which is 2.47 degrees above the July average. The highest temperature was 100.5 deg., on the 14th; the lowest was more than 35 deg. lower than the maximum. The mercury reached 90 deg. on 21 days, or 9 more than the July average. Mean temperature at 7 A.M., 76.30 deg.; at 2 P.M., 91.44 deg.; at 9 P.M., 81.66 deg.

MEAN CLOUDINESS.—24.31 per cent. of the sky, the month being 12.57 per cent. clearer than the July average. Number of clear days (less than one-third cloudy), 19; half-clear (less than two-thirds cloudy), 10; cloudy (more than two-thirds), 2.

There were 3 entirely clear days, and none entirely cloudy. Mean cloudiness at 7 A.M., 18.21 per cent.; at 2 P.M., 32.57 per cent.; at 9 P.M., 22.65 per cent.

WIND.—N.W. 13 times, N.E. 6 times, S.W. 15 times, S.E. 25 times, S. 25 times, E. 15 times, W. 7 times, N. 10 times. The total run of wind was 9,427 miles, which is 973 miles above the July average. This gives a mean daily velocity of 304 miles, and a mean hourly velocity of 12.7 miles. The highest velocity was 30 miles an hour, at 5:30 P.M. on the 14th.

BAROMETER.—Mean for the month, 29.063 inches, which is .007 less than the July average; at 7 A.M., 29.084 inches; at 9 P.M., 29.063 inches; maximum 29.205 inches, at 7 A.M. on the 4th; minimum, 28.859 inches, at 7 A.M. on the 13th; monthly range, .346 of an inch.

RELATIVE HUMIDITY.—Mean for the month 71.32, which is 1.26 higher than the July average; at 7 A.M., 75.8; at 9 P.M., 72.05; greatest, 95.5, at 7 A.M. on the 12th; least, 25.5, at 2 P.M. on the 4th. There was one fog, a light one, on the 22d.

The following table furnishes a comparison with the twenty-two preceding Julys:

| July. | Mean temperature..... | Maximum temperature..... | Minimum temperature..... | Ice days..... | Rain, inches..... | Feeling days..... | Thunder storms..... | Mean cloudiness..... | Humidity..... | No. of fogs..... | Miles of wind..... | Mean barometer..... | Maximum barometer..... | Minimum barometer..... |
|-----------|-----------------------|--------------------------|--------------------------|---------------|-------------------|-------------------|---------------------|----------------------|---------------|------------------|--------------------|---------------------|------------------------|------------------------|
| 1868..... | 85.08° | 101.0° | 70.0° | 26 | 4.05 | 4 | 1 | 45.96 | ..... | 0 | ..... | ..... | ..... | ..... |
| 1869..... | 74.25 | 93.0 | 47.0 | 6 | 5.05 | 11 | 7 | 53.33 | 84.5 | 2 | ..... | 29.037 | 29.284 | 28.777 |
| 1870..... | 79.22 | 99.0 | 55.0 | 22 | 5.58 | 12 | 4 | 30.64 | 64.2 | 2 | ..... | 29.058 | 29.252 | 28.813 |
| 1871..... | 79.14 | 103.0 | 60.0 | 17 | 7.30 | 13 | 6 | 49.79 | ..... | 0 | ..... | ..... | ..... | ..... |
| 1872..... | 77.11 | 93.5 | 61.5 | 11 | 6.50 | 13 | 9 | 50.86 | 75.2 | 2 | 9,203 | 29.061 | 29.283 | 28.772 |
| 1873..... | 76.95 | 97.0 | 62.5 | 12 | 2.38 | 6 | 2 | 30.54 | 64.3 | 1 | 9,952 | 29.083 | 29.253 | 28.699 |
| 1874..... | 83.16 | 103.0 | 68.0 | 21 | 1.19 | 5 | 4 | 26.88 | 52.1 | 0 | 10,904 | 29.079 | 29.256 | 28.765 |
| 1875..... | 76.63 | 97.5 | 65.0 | 8 | 6.60 | 13 | 5 | 51.30 | 73.0 | 0 | 8,458 | 29.070 | 29.383 | 28.877 |
| 1876..... | 78.60 | 95.0 | 60.0 | 12 | 3.51 | 6 | 3 | 30.48 | 72.7 | 0 | 8,901 | 29.075 | 29.268 | 28.817 |
| 1877..... | 75.13 | 99.0 | 54.0 | 8 | 5.76 | 11 | 8 | 32.04 | 73.4 | 0 | 8,355 | 29.091 | 29.355 | 28.865 |
| 1878..... | 78.40 | 98.0 | 58.0 | 15 | 4.30 | 7 | 4 | 31.29 | 78.2 | 0 | 7,974 | 29.073 | 29.265 | 28.739 |
| 1879..... | 79.14 | 97.5 | 62.5 | 16 | 3.66 | 9 | 4 | 31.90 | 73.8 | 1 | 6,980 | 29.040 | 29.219 | 28.884 |
| 1880..... | 75.75 | 98.0 | 54.0 | 13 | 2.34 | 8 | 5 | 28.28 | 68.3 | 0 | 9,312 | 29.166 | 29.335 | 28.926 |
| 1881..... | 79.74 | 102.0 | 57.5 | 18 | 2.28 | 6 | 2 | 26.23 | 72.5 | 1 | 7,541 | 29.098 | 29.314 | 28.761 |
| 1882..... | 72.05 | 99.0 | 52.0° | 11 | 4.03 | 9 | 3 | 38.92 | 75.0 | 0 | 7,464 | 29.122 | 29.410 | 28.893 |
| 1883..... | 76.18 | 96.5 | 56.0 | 17 | 7.23 | 10 | 5 | 39.46 | 71.4 | 0 | 10,901 | 29.086 | 29.381 | 28.679 |
| 1884..... | 76.93 | 98.0 | 60.5 | 10 | 5.18 | 15 | 5 | 41.67 | 71.7 | 1 | 8,733 | 29.004 | 29.289 | 28.809 |
| 1885..... | 77.06 | 96.0 | 56.0 | 17 | 6.03 | 13 | 5 | 43.79 | 72.9 | 0 | 8,422 | 29.065 | 29.265 | 28.833 |
| 1886..... | 79.54 | 100.0 | 57.0 | 21 | 0.11 | 4 | 2 | 31.83 | 58.4 | 0 | 6,857 | 29.037 | 29.183 | 28.853 |
| 1887..... | 79.79 | 102.0 | 55.5 | 18 | 2.14 | 7 | 4 | 24.19 | 62.7 | 0 | 7,010 | 29.067 | 29.211 | 28.901 |
| 1888..... | 79.52 | 97.0 | 62.0 | 17 | 4.28 | 7 | 7 | 32.10 | 71.1 | 0 | 7,160 | 29.104 | 29.300 | 28.950 |
| 1889..... | 76.00 | 91.0 | 56.0 | 6 | 6.34 | 10 | 5 | 45.40 | 75.5 | 0 | 7,070 | 29.052 | 29.264 | 28.845 |
| 1890..... | 80.54 | 100.5 | ..... | 21 | 1.55 | 5 | 3 | 24.31 | 71.32 | 1 | 9,427 | 29.063 | 29.205 | 28.859 |
| Mean.. | 78.08 | 98.2 | 58.7 | 15 | 4.23 | 9 | 4.6 | 36.88 | 70.60 | .5 | 8,454 | 29.070 | 9.285 | 28.825 |

REPORT FOR AUGUST.

After the first eight days the very hot weather which had prevailed continuously since June 17th came to a close, and the rest of the month was delightfully cool. The rainfall was abundant and well distributed.

MEAN TEMPERATURE — 73.74 degrees, which is 1.57 deg. below the August average. The highest temperature was 99 deg., on the 2d; the lowest was 55 deg. on the 18th, giving a range of 44 deg. The mercury exceeded 90 deg. on 8 days. Mean temperature at 7 A.M., 67.18 deg.; at 2 P.M., 83.79 deg.; at 9 P.M., 71.99 deg.

RAINFALL — 6.19 inches, which is 2.12 inches below the August average. Rain fell in measurable quantities on 12 days. There were 5 thunder showers. The entire rainfall for the 8 months of 1890 now completed, has been 21.79 inches, which is 3.64 inches below the average for the same months in the preceding 22 years.

MEAN CLOUDINESS — 34.79 per cent. of the sky, the month being 0.97 per cent. clearer than usual. Number of clear days (less than one-third cloudy), 17; half-clear

(from one to two-thirds cloudy). 10; cloudy (more than two-thirds), 4. There were 3 entirely clear days and one entirely cloudy. Mean cloudiness at 7 A.M., 43.87 per cent.; at 2 P.M., 31.30 per cent.; at 9 P.M., 29.19 per cent.

WIND.—S. W. 24 times, N. E. 23 times, S. E. 23 times, N. W. 7 times, E. 7 times, S. 4 times, N. 3 times, W. twice. The total run of the wind was 8,449 miles, which is 106 miles above the August average. This gives a mean daily velocity of 272 miles and a mean hourly velocity of 11.35 miles. The highest velocity was 30 miles an hour, on the 2d.

BAROMETER.—Mean for the month, 29.105 inches; at 7 A.M., 29.122 inches; at 2 P.M., 29.091 inches; at 9 P.M., 29.101 inches; maximum, 29.472 inches, on the 9th; minimum, 28.819 inches, on the 12th and 20th; monthly range, 0.653 inch.

The following table furnishes a comparison with the 22 preceding Augusts:

| August. | Mean temperature... | Maximum temperature... | Minimum temperature... | Hot days..... | Rain, inches..... | Rainy days..... | Thunder storms..... | Mean cloudiness..... | Humidity..... | Number of fogs..... | Miles of wind..... | Mean barometer..... | Maximum barometer..... | Minimum barometer..... |
|-----------|---------------------|------------------------|------------------------|---------------|-------------------|-----------------|---------------------|----------------------|---------------|---------------------|--------------------|---------------------|------------------------|------------------------|
| 1868..... | 73.37° | 93.0° | 57.0° | 3 | 8.32 | 6 | 5 | 42.87 | ..... | 0 | ..... | ..... | ..... | ..... |
| 1869..... | 78.54 | 100.0 | 56.0 | 16 | 6.46 | 13 | 3 | 45.49 | 78.6 | 1 | ..... | 29.092 | 29.235 | 28.924 |
| 1870..... | 72.46 | 98.0 | 53.0 | 11 | 6.69 | 15 | 7 | 52.80 | 72.8 | 1 | ..... | 29.076 | 29.326 | 28.761 |
| 1871..... | 74.06 | 100.0 | 45.1 | 16 | 2.76 | 9 | 4 | 39.44 | ..... | 0 | ..... | ..... | ..... | ..... |
| 1872..... | 76.32 | 97.0 | 53.0 | 13 | 4.71 | 13 | 6 | 33.76 | 72.0 | 0 | 8,698 | 29.120 | 29.220 | 28.867 |
| 1873..... | 78.35 | 104.0 | 56.0 | 24 | 0.90 | 6 | 2 | 23.87 | 57.8 | 0 | 8,190 | 29.134 | 29.330 | 28.974 |
| 1874..... | 82.75 | 108.0 | 65.0 | 26 | 1.00 | 6 | 6 | 24.95 | 49.0 | 0 | 10,099 | 29.076 | 29.289 | 28.916 |
| 1875..... | 72.50 | 91.5 | 55.0 | 2 | 2.90 | 7 | 3 | 32.79 | 68.1 | 0 | 9,484 | 29.080 | 29.329 | 28.919 |
| 1876..... | 77.70 | 94.0 | 63.0 | 17 | 4.45 | 11 | 6 | 26.66 | 72.4 | 0 | 8,245 | 29.103 | 29.402 | 28.794 |
| 1877..... | 74.10 | 97.0 | 51.5 | 7 | 2.30 | 5 | 3 | 29.57 | 72.0 | 0 | 8,572 | 29.076 | 29.289 | 28.916 |
| 1878..... | 77.14 | 98.0 | 56.0 | 11 | 2.22 | 7 | 4 | 19.19 | 74.6 | 0 | 8,188 | 29.045 | 29.230 | 28.879 |
| 1879..... | 75.78 | 99.5 | 49.0 | 16 | 1.03 | 5 | 5 | 28.92 | 63.8 | 1 | 6,835 | 29.053 | 29.386 | 28.801 |
| 1880..... | 75.45 | 101.0 | 50.5 | 14 | 7.93 | 10 | 5 | 45.70 | 70.1 | 0 | 8,863 | 29.070 | 29.349 | 28.859 |
| 1881..... | 81.23 | 104.0 | 62.0 | 29 | 1.57 | 5 | 2 | 31.29 | 62.5 | 0 | 7,991 | 29.050 | 29.178 | 28.875 |
| 1882..... | 72.55 | 95.0 | 52.5 | 11 | 0.09 | 6 | 1 | 32.37 | 72.4 | 1 | 7,463 | 29.116 | 29.305 | 28.935 |
| 1883..... | 72.04 | 92.5 | 52.0 | 1 | 2.12 | 6 | 4 | 39.89 | 77.0 | 0 | 7,640 | 29.158 | 29.353 | 28.885 |
| 1884..... | 71.14 | 92.5 | 47.5 | 3 | 5.49 | 11 | 4 | 48.16 | 77.8 | 3 | 9,392 | 29.110 | 29.405 | 28.849 |
| 1885..... | 73.22 | 95.0 | 53.0 | 7 | 3.70 | 8 | 3 | 33.87 | 77.8 | 0 | 9,124 | 29.065 | 29.321 | 28.778 |
| 1886..... | 79.02 | 105.0 | 51.5 | 18 | 2.49 | 11 | 6 | 28.60 | 71.2 | 0 | 8,840 | 29.048 | 29.214 | 28.861 |
| 1887..... | 73.62 | 99.0 | 49.0 | 10 | 4.88 | 12 | 5 | 46.24 | 60.1 | 0 | 6,990 | 29.077 | 29.292 | 28.906 |
| 1888..... | 72.91 | 97.0 | 52.0 | 3 | 9.07 | 12 | 6 | 48.51 | 72.1 | 2 | 7,841 | 29.100 | 29.470 | 28.825 |
| 1889..... | 72.69 | 89.0 | 57.0 | 0 | 8.38 | 6 | 6 | 31.50 | 79.6 | 2 | 7,840 | 29.154 | 29.460 | 28.979 |
| 1890..... | 73.74 | 99.0 | 55.0 | 8 | 6.19 | 12 | 4 | 34.79 | ..... | 2 | 8,449 | 29.105 | 29.472 | 28.819 |
| Mean... | 75.37 | 97.7 | 53.9 | 12 | 4.16 | 9 | 4 | 35.72 | 70.0 | .5 | 8,348 | 29.091 | 29.328 | 28.873 |

REPORT FOR SEPTEMBER.

The coolest September on our 23 years' record, except September, 1868. The first white frost occurred on the 13th—the earliest autumn date for such frost except in 1873. The average date for the first autumn frost is October 1st. The rainfall was almost double the average for September, bringing the total precipitation for 1890 nearly up to the average.

MEAN TEMPERATURE—63.01 degrees, which is 2.88 deg. below the September average. The highest temperature was 89.5 deg., on the 2d; the lowest was 37 deg. on the 13th, giving a range of 76.5 deg. Mean temperature at 7 A.M., 56.57 deg.; at 2 P.M., 71.82 deg.; at 9 P.M., 62.03 deg.

RAINFALL—5.62 inches, which is 2.11 inches above the September average. Rain fell in measurable quantities on 9 days. There was one thunder shower. The entire rainfall for the 9 months of 1890 now completed has been 27.41 inches, which is only 1.53 inches below the average for the same months in the preceding 22 years.

MEAN CLOUDINESS—51.67 per cent. of the sky, the month being 11.68 per cent. cloudier than usual. Number of clear days (less than one-third cloudy), 9; half-clear (from one to two-thirds cloudy), 11; cloudy (more than two-thirds), 10. There were

2 entirely clear days and 3 entirely cloudy. Mean cloudiness at 7 A. M., 61.17 per cent.; at 2 P. M., 54 per cent.; at 9 P. M., 39.83 per cent.

WIND.—N. E. 22 times, S. E. 17 times, N. 16 times, S. W. 14 times, N. W. 11 times, S. 8 times, E. twice. The total run of the wind was 9,191 miles, which is 1,107 miles below the September average. This gives a mean daily velocity of 306 miles and a mean hourly velocity of 12.75 miles. The highest velocity was 40 miles an hour, on the 6th, from noon to 3 P. M.

BAROMETER.—Mean for the month, 29.102 inches; at 7 A. M., 29.183 inches; at 2 P. M., 29.142 inches; at 9 P. M., 29.161 inches; maximum, 29.494 inches, on the 28th; minimum, 28.834 inches, on the 6th; monthly range, 0.660 inch.

RELATIVE HUMIDITY.—Mean for the month, 78.8; at 7 A. M., 89.8; at 2 P. M., 61.4; at 9 P. M., 84.9; greatest, 100, on five occasions; least, 44, on the 13th. There was one fog.

The following table furnishes a comparison with the twenty-two preceding Augusts.

| September. | Mean temperature..... | Maximum temperature..... | Minimum temperature..... | Hot days..... | Rain, inches..... | Feeling days..... | Thunder storms. | Mean cloudiness..... | Humidity..... | No. of fogs..... | Miles of wind.. | Mean barometer..... | Maximum barometer..... | Minimum barometer..... |
|------------|-----------------------|--------------------------|--------------------------|---------------|-------------------|-------------------|-----------------|----------------------|---------------|------------------|-----------------|---------------------|------------------------|------------------------|
| 1868..... | 61.79° | 93.0° | 29.6° | 2 | 4.29 | 6 | 3 | 46.77 | 78.6 | 0 | ..... | 29.149 | 29.481 | 28.680 |
| 1869..... | 63.96 | 85.0 | 30.0 | 0 | 4.45 | 6 | 2 | 45.44 | 82.8 | 1 | ..... | 29.118 | 29.328 | 28.870 |
| 1870..... | 67.15 | 88.5 | 53.0 | 0 | 2.82 | 11 | 2 | 68.66 | 82.8 | 3 | ..... | 29.149 | 29.493 | 28.926 |
| 1871..... | 64.40 | 92.5 | 36.0 | 5 | 1.49 | 3 | 1 | 34.67 | 63.5 | 0 | ..... | 29.197 | 29.493 | 28.641 |
| 1872..... | 63.99 | 94.0 | 37.0 | 5 | 2.55 | 8 | 4 | 38.33 | 65.0 | 0 | 12,084 | 29.055 | 29.367 | 28.740 |
| 1873..... | 65.47 | 94.0 | 36.0 | 6 | 3.75 | 6 | 2 | 40.78 | 59.9 | 2 | 12,250 | 29.125 | 29.560 | 28.699 |
| 1874..... | 66.39 | 94.0 | 41.0 | 3 | 6.45 | 12 | 2 | 45.89 | 71.7 | 0 | 11,700 | 29.117 | 29.396 | 28.947 |
| 1875..... | 65.75 | 95.0 | 38.0 | 7 | 1.39 | 5 | 1 | 37.66 | 64.3 | 1 | 10,276 | 29.166 | 29.479 | 28.763 |
| 1876..... | 64.79 | 92.0 | 34.0 | 4 | 3.58 | 6 | 1 | 38.89 | 68.6 | 1 | 11,196 | 29.103 | 29.494 | 28.789 |
| 1877..... | 66.93 | 90.0 | 43.0 | 1 | 1.35 | 5 | 2 | 33.25 | 71.7 | 3 | 6,817 | 29.096 | 29.359 | 28.663 |
| 1878..... | 67.58 | 94.5 | 41.0 | 6 | 2.51 | 4 | 2 | 30.65 | 66.4 | 0 | 11,972 | 29.120 | 29.513 | 28.901 |
| 1879..... | 65.40 | 92.0 | 42.0 | 2 | 3.57 | 6 | 2 | 37.00 | 64.0 | 0 | 10,237 | 29.162 | 29.464 | 28.798 |
| 1880..... | 64.59 | 85.0 | 42.0 | 0 | 2.46 | 7 | 2 | 32.00 | 73.2 | 1 | 10,124 | 29.144 | 29.424 | 28.693 |
| 1881..... | 70.59 | 99.0 | 42.5 | 14 | 5.72 | 11 | 4 | 43.89 | 60.7 | 1 | 10,722 | 29.001 | 29.308 | 28.816 |
| 1882..... | 69.30 | 105.0 | 46.0 | 7 | 1.65 | 5 | 4 | 35.67 | 59.2 | 1 | 10,026 | 29.155 | 29.417 | 28.906 |
| 1883..... | 63.52 | 91.0 | 45.5 | 1 | 1.25 | 7 | 1 | 40.33 | 67.8 | 1 | 9,945 | 29.144 | 29.462 | 28.810 |
| 1884..... | 70.36 | 92.0 | 48.0 | 5 | 9.15 | 8 | 5 | 40.00 | 76.3 | 3 | 11,409 | 29.037 | 29.404 | 28.731 |
| 1885..... | 65.43 | 86.0 | 49.0 | 0 | 5.41 | 8 | 4 | 41.00 | 73.8 | 2 | 8,611 | 29.084 | 29.375 | 28.970 |
| 1886..... | 71.19 | 97.0 | 42.0 | 7 | 2.34 | 8 | 3 | 32.00 | 60.7 | 0 | 10,315 | 29.090 | 29.377 | 28.731 |
| 1887..... | 67.56 | 91.0 | 43.5 | 6 | 5.73 | 10 | 1 | 52.33 | 72.2 | 1 | 9,910 | 29.116 | 29.421 | 28.796 |
| 1888..... | 66.04 | 91.0 | 39.0 | 2 | 0.23 | 1 | 0 | 22.44 | 65.7 | 1 | 8,043 | 29.170 | 29.603 | 28.819 |
| 1889..... | 63.17 | 89.0 | 38.0 | 0 | 5.02 | 9 | 1 | 42.06 | 78.6 | 3 | 8,830 | 29.101 | 29.555 | 28.348 |
| 1890..... | 64.11 | 89.5 | 57.0 | 0 | 5.62 | 9 | 1 | 51.67 | 78.8 | 1 | 9,191 | 29.162 | 29.494 | 28.798 |
| Mean... | 66.00 | 92.3 | 40.5 | 4 | 3.60 | 7 | 3 | 40.50 | 69.1 | 1 | 10,240 | 29.118 | 29.444 | 28.798 |

REPORT FOR OCTOBER.

A delightful autumn month, with temperature slightly warmer than usual and rainfall nearly double the average amount. The cloudiness and wind velocity were slightly below the normal values. The first severe frost of the season, when the mercury for the first time fell below the freezing point, occurred on the 27th—one week later than the average date. This long absence of freezing temperature from the air above the ground explains the unusually long continuance of the bright autumn foliage.

MEAN TEMPERATURE—54.85 degrees, which is 0.46 degrees above the October average. The highest temperature was 80.5 degrees, on the 9th and 10th; the lowest was 28.5 degrees, on the 31st, giving a range of 52 degrees. Mean temperature at 7 A. M., 46.92 degrees; at 2 P. M., 64.81 degrees; at 9 P. M., 53.84 degrees.

RAINFALL—5.35 inches, which is 2.46 inches above the October average. Rain fell in measurable quantities on 6 days. There were two thunder showers. The

entire rainfall for the 10 months of 1890 now completed has been 32.76 inches, which is 0.93 inch above the average for the same months in the preceding 22 years.

MEAN CLOUDINESS—36.59 per cent. of the sky, the month being 1.72 per cent. clearer than usual. Number of clear days (less than one-third cloudy), 16; half-clear (from one to two-thirds cloudy), 10; cloudy (more than two-thirds), 5. There were eight entirely clear days and only one entirely cloudy. Mean cloudiness at 7 A. M., 38.55 per cent.; at 2 P. M., 48.95 per cent.; at 9 P. M., 22.26 per cent.

WIND.—S. W. 28 times, N. W. 24 times, N. E. 13 times, S. 10 times, S. E. 10 times, E. 3 times, W. 3 times, N. twice. The total run of the wind was 10,870 miles, which is 523 miles below the October average. This gives a mean daily velocity of 350.64 miles and a mean hourly velocity of 14.61 miles. The highest velocity was 33 miles an hour, on the 25th, from 2 to 3 P. M.

BAROMETER.—Mean for the month, 29.053 inches; at 7 A. M., 29.088 inches; at 2 P. M., 29.028 inches; at 9 P. M., 29.043; maximum, 29.406 inches, on the 31st; minimum, 28.676 inches, on the 12th; monthly range, 0.730 inch.

The following table furnishes a comparison with the 22 preceding Octobers:

| October. | Mean temperature... | Maximum temperature... | Minimum temperature... | Hot days..... | Rain, inches..... | Snow, inches..... | Rainy days..... | Thunder storms, | Mean cloudiness..... | Humidity | No. of fogs..... | Miles of wind... | Mean barometer..... | Maximum barometer..... | Minimum barometer..... |
|-----------|------------------------|---------------------------|---------------------------|---------------|-------------------|-------------------|-----------------|-----------------|-------------------------|----------------|------------------|------------------|------------------------|---------------------------|---------------------------|
| 1868..... | 52.37 | 82.0 | 25.0 | 0 | 1.58 | 0.00 | 4 | 0 | 36.34 | 71.7 | 5 | ..... | 29.180 | 29.519 | 28.790 |
| 1869..... | 43.97 | 78.0 | 15.0 | 0 | 0.69 | 1.25 | 5 | 0 | 25.38 | ..... | 0 | ..... | 29.219 | 29.554 | 28.835 |
| 1870..... | 55.85 | 79.0 | 29.0 | 0 | 6.96 | 0.00 | 12 | 2 | 54.19 | 75.9 | 1 | ..... | 29.126 | 29.426 | 28.758 |
| 1871..... | 55.37 | 90.0 | 32.0 | 1 | 3.58 | 0.00 | 8 | 0 | 36.77 | 60.2 | 2 | ..... | 29.110 | 29.452 | 28.809 |
| 1872..... | 54.90 | 92.0 | 27.0 | 2 | 1.95 | 0.00 | 4 | 2 | 21.40 | 53.6 | 1 | 11,108 | 29.140 | 29.574 | 28.701 |
| 1873..... | 50.52 | 83.0 | 16.5 | 0 | 0.92 | 0.00 | 6 | 1 | 29.59 | 57.8 | 0 | 13,845 | 29.171 | 29.487 | 28.709 |
| 1874..... | 55.52 | 89.0 | 19.5 | 0 | 1.92 | 0.00 | 4 | 1 | 39.03 | 67.2 | 4 | 11,691 | 29.199 | 29.608 | 28.682 |
| 1875..... | 55.18 | 86.0 | 25.0 | 0 | 1.16 | 0.00 | 4 | 1 | 36.23 | 56.2 | 1 | 13,493 | 29.115 | 29.461 | 28.596 |
| 1876..... | 53.40 | 83.5 | 25.0 | 0 | 1.93 | 0.00 | 6 | 2 | 35.91 | 59.8 | 0 | 11,243 | 29.058 | 29.591 | 28.494 |
| 1877..... | 54.45 | 80.0 | 34.0 | 0 | 5.85 | 0.00 | 12 | 3 | 58.49 | 79.3 | 3 | 7,530 | 29.095 | 29.375 | 28.731 |
| 1878..... | 55.55 | 87.0 | 20.0 | 0 | 0.44 | 1.00 | 6 | 1 | 28.92 | 63.7 | 0 | 15,106 | 29.144 | 29.618 | 28.835 |
| 1879..... | 60.46 | 87.5 | 25.5 | 0 | 2.81 | 0.00 | 7 | 2 | 31.94 | 71.2 | 1 | 10,952 | 29.253 | 29.745 | 28.752 |
| 1880..... | 52.52 | 81.0 | 28.0 | 0 | 2.73 | 0.00 | 6 | 0 | 39.24 | 66.3 | 0 | 12,745 | 29.094 | 29.631 | 28.604 |
| 1881..... | 59.27 | 91.0 | 39.5 | 1 | 4.35 | 0.00 | 9 | 3 | 31.72 | 74.2 | 3 | 12,189 | 29.123 | 29.488 | 28.515 |
| 1882..... | 58.54 | 84.5 | 34.0 | 0 | 3.08 | 0.00 | 9 | 5 | 41.51 | 69.2 | 2 | 11,435 | 29.049 | 29.427 | 28.254 |
| 1883..... | 52.67 | 87.0 | 32.5 | 0 | 6.75 | 1.00 | 15 | 4 | 58.27 | 72.9 | 4 | 11,773 | 29.132 | 29.558 | 28.594 |
| 1884..... | 57.87 | 85.0 | 31.0 | 0 | 2.38 | 0.00 | 8 | 2 | 34.19 | 74.8 | 5 | 10,150 | 29.179 | 29.568 | 28.912 |
| 1885..... | 51.22 | 77.0 | 29.0 | 0 | 3.32 | 0.00 | 7 | 2 | 38.92 | 70.5 | 3 | 9,358 | 29.089 | 29.416 | 28.795 |
| 1886..... | 60.23 | 86.0 | 27.0 | 0 | 1.59 | 0.00 | 4 | 3 | 25.91 | 59.1 | 1 | 10,685 | 29.219 | 29.633 | 28.680 |
| 1887..... | 52.01 | 87.0 | 26.0 | 0 | 3.83 | 0.00 | 6 | 1 | 24.09 | 65.8 | 0 | 12,250 | 29.178 | 29.721 | 28.685 |
| 1888..... | 53.07 | 85.0 | 32.0 | 0 | 3.74 | 0.00 | 4 | 2 | 39.46 | 66.6 | 1 | 11,160 | 29.078 | 29.370 | 28.738 |
| 1889..... | 53.56 | 89.0 | 31.0 | 0 | 2.09 | 0.00 | 6 | 2 | 49.25 | 72.2 | 4 | 8,510 | 29.178 | 29.525 | 28.771 |
| 1890..... | 51.85 | 80.5 | 28.5 | 0 | 5.35 | 0.00 | 6 | 2 | 36.59 | ..... | 6 | 10,870 | 29.053 | 29.496 | 28.676 |
| Mean..... | 54.41 | 84.8 | 29.4 | 0 | 3.00 | 0.14 | 8 | 2 | 38.23 | 67.0 | 2 | 11,370 | 29.138 | 29.528 | 28.659 |

REPORT FOR NOVEMBER.

One of the four warmest Novembers on our record. In 1870, 1878, and 1879 the month was but slightly warmer, the mean temperatures being 44.54, 45.87, and 44.26 degrees. No other November has had so small a percentage of cloudiness. No frost of the season has yet been severe enough to destroy all garden vegetation. Dandelion blossoms were picked in Lawrence yards on Thanksgiving day.

MEAN TEMPERATURE—44.09 degrees, which is 4.20 deg. above the November average. The highest temperature was 68 deg., on the 1st and 20th; the lowest was 24 deg., on the 26th, giving a range of 44 deg. Mean temperature at 7 A. M., 35.73 deg.; at 2 P. M., 53.75 deg.; at 9 P. M., 43.43 deg.

RAINFALL—2.56 inches, which is 0.60 inch above the November average. Rain fell in measurable quantities on 5 days. There were no thunder showers. The

entire rainfall for the 11 months of 1890 now completed has been 35.32 inches, which is 1.53 inches above the average for the same months in the preceding 22 years, and 0.22 inch above the average annual rainfall for this station.

MEAN CLOUDINESS.—29.33 per cent. of the sky, the month being 16.71 per cent. clearer than usual. Number of clear days (less than one-third cloudy), 19; half-clear (from one to two-thirds cloudy), 6; cloudy (more than two-thirds), 5. There were 10 entirely clear days, and 4 entirely cloudy. Mean cloudiness at 7 A. M., 33.33 per cent.; at 2 P. M., 29 per cent.; at 9 P. M., 25.67 per cent.

WIND.—S. W. 36 times, N. W. 28 times, N. E. 9 times, N. 7 times, S. E. 6 times, S. twice, E. once, W. once. The total run of the wind was 10,395 miles, which is 1,594 miles below the November average. This gives a mean daily velocity of 346.5 miles, and a mean hourly velocity of 14.44 miles. The highest velocity was 36 miles an hour, on the 2d.

BAROMETER.—Mean for the month, 29.223 inches; at 7 A. M., 29.246 inches; at 2 P. M., 29.194 inches; at 9 P. M., 29.227 inches; maximum, 29.695 inches, on the 22d; minimum, 28.753 inches, on the 5th; monthly range, 0.942 inch.

RELATIVE HUMIDITY.—Mean for the month, 73.8; at 7 A. M., 87.5; at 2 P. M., 55.4; at 9 P. M., 78.5; greatest, 100, on 4 occasions; least, 32, on the 22d. There was one fog.

The following table furnishes a comparison with 22 preceding Novembers:

| Minimum barometer..... | Maximum barometer..... | Mean barometer..... | Miles of wind..... | First black frost..... | First white frost..... | Number of fogs..... | Humidity..... | Mean cloudiness..... | Thun. storms..... | Rainy days..... | Snow, inches..... | Rain, inches..... | Winter days..... | Minimum temperature... | Maximum temperature... | Mean temperature... | November..... |
|---------------------------|---------------------------|------------------------|--------------------|---------------------------|---------------------------|---------------------|---------------|-------------------------|-------------------|-----------------|----------------------|----------------------|------------------|------------------------------------|------------------------------------|---------------------------------|---------------|
| 28.880 | 29.660 | 29.201 | ..... | S 17 | S 16 | 1 | 69.8 | 51.77 | 5 | 6.0 | 6.0 | 3.54 | 12 | 17.0 | 73.0 | 37.59 | 1868..... |
| 28.506 | 29.447 | 29.111 | ..... | S 25 | S 25 | 2 | ..... | 62.89 | 8 | 0.0 | 0.0 | 1.86 | 9 | 23.0 | 72.0 | 39.01 | 1869..... |
| 28.658 | 29.605 | 29.151 | ..... | O 31 | O 12 | 0 | ..... | 36.83 | 3 | 0.0 | 0.0 | 0.57 | 2 | 17.0 | 72.0 | 44.54 | 1870..... |
| 28.641 | 29.546 | 29.106 | ..... | N 1 | S 27 | 1 | ..... | 57.44 | 12 | 5.0 | 14.0 | 2.48 | 13 | 3.0 | 72.5 | 35.60 | 1871..... |
| 28.650 | 29.779 | 29.174 | 12,202 | O 10 | S 27 | 0 | ..... | 44.89 | 1 | 0.0 | 0.0 | 0.01 | 14 | -1.0 | 67.0 | 33.03 | 1872..... |
| 28.593 | 29.540 | 29.129 | 15,414 | O 6 | S 8 | 0 | ..... | 35.00 | 2 | 0 | 0 | 1.24 | 4 | 12.0 | 78.0 | 42.10 | 1873..... |
| 28.276 | 29.677 | 29.164 | 16,104 | O 12 | S 15 | 0 | ..... | 56.67 | 10 | 3.0 | 14.0 | 3.69 | 12 | 5.5 | 77.5 | 38.35 | 1874..... |
| 28.582 | 29.677 | 29.132 | 12,282 | O 18 | S 18 | 0 | ..... | 52.78 | 3 | 0 | 0 | 0.30 | 11 | 0.0 | 70.0 | 35.55 | 1875..... |
| 28.675 | 29.771 | 29.171 | 12,287 | O 1 | S 29 | 0 | ..... | 46.11 | 5 | 3.5 | 5.0 | 2.60 | 8 | 9.0 | 72.0 | 37.50 | 1876..... |
| 28.797 | 29.642 | 29.169 | 9,949 | N 5 | O 4 | 1 | ..... | 48.89 | 1 | 0.0 | 0.0 | 1.47 | 5 | 9.0 | 64.0 | 39.23 | 1877..... |
| 28.635 | 29.535 | 29.137 | 11,198 | O 8 | O 18 | 1 | ..... | 42.00 | 0 | 2.0 | 5.0 | 1.55 | 0 | 22.0 | 72.0 | 45.87 | 1878..... |
| 28.716 | 29.756 | 29.147 | 11,964 | O 24 | O 14 | 3 | ..... | 38.33 | 6 | 2.0 | 6.4 | 5.15 | 5 | 16.0 | 76.5 | 44.26 | 1879..... |
| 28.782 | 29.791 | 29.293 | 11,325 | O 17 | S 13 | 2 | ..... | 51.77 | 9 | 2.5 | 9.0 | 2.24 | 16 | 7.5 | 65.5 | 31.58 | 1880..... |
| 28.599 | 29.656 | 29.186 | 13,906 | N 9 | S 25 | 2 | ..... | 45.65 | 5 | 0.0 | 0.0 | 2.55 | 6 | 11.0 | 71.5 | 40.40 | 1881..... |
| 28.779 | 29.549 | 29.241 | 11,118 | N 11 | O 19 | 0 | ..... | 43.11 | 0 | 7.0 | 0.0 | 2.08 | 3 | 20.0 | 80.0 | 43.07 | 1882..... |
| 28.640 | 29.795 | 29.147 | 12,692 | N 1 | O 14 | 5 | ..... | 38.22 | 2 | 3.2 | 1.0 | 0.73 | 4 | 14.5 | 74.0 | 42.77 | 1883..... |
| 28.634 | 29.563 | 29.175 | 10,503 | O 23 | O 8 | 5 | ..... | 40.77 | 0 | 1.5 | 3.0 | 0.80 | 3 | 9.5 | 70.0 | 41.53 | 1884..... |
| 28.379 | 29.397 | 29.065 | 11,538 | O 6 | O 4 | 0 | ..... | 50.89 | 0 | 4.0 | 0.0 | 1.43 | 1 | 20.0 | 76.0 | 43.33 | 1885..... |
| 28.523 | 29.699 | 29.121 | 13,230 | O 27 | O 1 | 0 | ..... | 35.11 | 5 | 0.5 | 5.0 | 1.88 | 6 | 15.0 | 66.0 | 40.08 | 1886..... |
| 28.761 | 29.551 | 29.177 | 11,610 | O 24 | O 12 | 1 | ..... | 38.89 | -1 | 1.0 | -1.0 | 1.40 | 6 | -1.0 | 79.0 | 42.55 | 1887..... |
| 28.609 | 29.642 | 29.223 | 9,520 | N 9 | S 28 | 1 | ..... | 50.67 | 1 | 0.0 | 12.0 | 4.54 | 7 | 21.0 | 79.0 | 39.20 | 1888..... |
| 28.802 | 29.705 | 29.208 | 10,060 | O 27 | S 27 | 0 | ..... | 44.18 | 0 | 3.0 | 0.0 | 1.96 | 4 | 11.0 | 65.0 | 38.25 | 1889..... |
| 28.753 | 29.695 | 29.223 | 10,395 | O 27 | S 13 | 1 | ..... | 29.33 | 0 | 5.0 | 0.0 | 2.56 | 0 | 24.0 | 68.0 | 44.09 | 1890..... |
| 28.664 | 29.552 | 29.151 | 11,907 | O 20 | O 1 | 2 | ..... | 44.77 | 5.5 | 2.2 | 2.2 | 1.99 | 7 | 12.2 | 73.0 | 39.97 | Mean.. |

REPORT FOR DECEMBER.

A warm, clear December, and a dry one up to the last week. No December in 23 years has had so much sunshine, while only four have been warmer. The mercury failed to reach the zero point by 15 degrees. A most remarkable feature of the season is the delay of the first snow 43 days beyond the average date. In every preceding year October or November has seen its first occurrence. The rain of the 31st was accompanied by thunder and lightning.

MEAN TEMPERATURE—35.98 degrees, which is 5.88 deg. above the December average. The highest temperature was 67 deg., on the 10th; the lowest was 15 deg., on

the 8th, giving a range of 52 deg. Mean temperature at 7 A. M., 28.97 deg.; at 2 P. M., 44.72 deg.; at 9 P. M., 35.11 deg.

RAINFALL—including melted snow—1.00 inch, which is 0.55 inch below the December average. Rain and snow fell in measurable quantities on 2 days. The entire depth of snow was 4 inches. There was one thunder shower. The entire rainfall for the twelve months of 1890, now completed, has been 36.32 inches, which is 0.82 inch above the average for the annual rainfall of the preceding twenty-two years.

MEAN CLOUDINESS—33.39 per cent. of the sky, the month being 17.53 per cent. clearer than usual. Number of clear days (less than one-third cloudy), 20; half-clear (from one to two-thirds cloudy), 4; cloudy (more than two-thirds), 7. There were 11 entirely clear days, and 3 entirely cloudy. Mean cloudiness at 7 A. M., 17.89 per cent.; at 2 P. M., 17.61 per cent.; at 9 P. M., 17.08 per cent.

WIND.—S. W. 27 times, N. W. 22 times, N. E. 13 times, N. 10 times, S. 10 times, S. E. 7 times, E. 3 times, W. once. The total run of the wind was 12,800 miles, which is 1,008 miles above the December average. This gives a mean daily velocity of 412.90 miles, and a mean hourly velocity of 17.20 miles. The highest velocity was 48 miles an hour, from 1:10 to 1:20 P. M. on the 2d.

BAROMETER.—Mean for the month, 29.214 inches; at 7 A. M., 29.240 inches; at 2 P. M., 29.183 inches; at 9 P. M., 29.218 inches; maximum, 29.677 inches, on the 12th; minimum, 28.437 inches, on the 31st; monthly range, 1.240 inches.

RELATIVE HUMIDITY.—Mean for the month, 75.7; at 7 A. M., 88.0; at 2 P. M., 57.1; at 9 P. M., 80.3; greatest, 100, on numerous occasions; least, 23, on the 16th. There were 2 fogs.

The following table furnishes a comparison with the 22 preceding Decembers:

| December..... | Mean temperature..... | Maximum temperature..... | Minimum temperature..... | Winter days..... | Zero days..... | Rain, inches..... | Snow, inches..... | Thunder storms, days..... | Mean cloudiness..... | Humidity..... | No. of fogs..... | First snow, | Miles of wind..... | Mean barometer..... | Maximum barometer..... | Minimum barometer..... | |
|---------------|-----------------------|--------------------------|--------------------------|------------------|----------------|-------------------|-------------------|---------------------------|----------------------|---------------|------------------|-------------------|--------------------|---------------------|------------------------|------------------------|--------|
| 1868..... | 23.91 | 53.0 | -16.0 | 25 | 4 | 2.13 | 16.0 | 6 | 0 | 49.16 | 77.2 | 1 | N | 9 | 29.205 | 29.847 | 28.497 |
| 1869..... | 29.63 | 65.0 | 4.0 | 7 | 0 | 0.87 | 5.5 | 6 | 0 | 56.56 | 72.2 | 4 | O | 19 | 29.187 | 29.550 | 28.640 |
| 1870..... | 28.39 | 64.0 | -10.0 | 15 | 4 | 0.72 | 6.5 | 5 | 0 | 49.79 | 73.1 | 1 | N | 23 | 29.192 | 29.705 | 28.566 |
| 1871..... | 24.45 | 58.0 | -6.0 | 21 | 4 | 1.12 | 5.7 | 6 | 0 | 45.27 | 65.9 | 1 | O | 31 | 29.192 | 29.743 | 28.561 |
| 1872..... | 19.81 | 58.5 | -18.0 | 21 | 8 | 1.24 | 11.0 | 4 | 0 | 41.30 | 65.7 | 1 | N | 14 | 11.533 | 29.299 | 29.674 |
| 1873..... | 31.07 | 67.5 | 9.0 | 15 | 0 | 4.39 | 3.5 | 11 | 2 | 61.50 | 76.2 | 0 | O | 27 | 12.254 | 29.199 | 29.655 |
| 1874..... | 30.75 | 67.5 | -3.0 | 19 | 1 | 1.17 | 7.5 | 5 | 0 | 47.00 | 79.4 | 1 | N | 17 | 11.820 | 29.236 | 29.687 |
| 1875..... | 39.35 | 73.0 | 0.0 | 9 | 1 | 3.55 | 0.0 | 5 | 2 | 49.14 | 66.6 | 0 | N | 13 | 13.688 | 29.027 | 29.528 |
| 1876..... | 23.60 | 66.0 | -5.0 | 21 | 3 | 0.43 | 4.0 | 5 | 0 | 37.85 | 68.9 | 0 | N | 13 | 11.063 | 29.260 | 29.708 |
| 1877..... | 41.43 | 68.0 | 10.0 | 2 | 0 | 2.12 | 0.5 | 10 | 2 | 58.17 | 74.4 | 0 | N | 8 | 10.683 | 29.191 | 29.575 |
| 1878..... | 23.05 | 53.0 | -6.0 | 25 | 7 | 1.98 | 20.0 | 6 | 0 | 53.75 | 65.7 | 1 | O | 26 | 9.090 | 29.268 | 29.735 |
| 1879..... | 26.23 | 65.5 | -9.0 | 21 | 2 | 2.39 | 3.0 | 5 | 1 | 51.83 | 71.0 | 2 | N | 28 | 12.821 | 29.172 | 29.702 |
| 1880..... | 25.84 | 61.0 | -12.0 | 20 | 2 | 0.43 | 1.5 | 8 | 0 | 54.08 | 76.5 | 4 | N | 16 | 11.661 | 29.243 | 29.733 |
| 1881..... | 40.10 | 63.0 | 18.0 | 1 | 0 | 0.90 | 1.0 | 4 | 0 | 55.26 | 68.3 | 1 | N | 18 | 12.679 | 29.214 | 29.544 |
| 1882..... | 31.25 | 58.0 | -9.5 | 16 | 1 | 1.21 | 5.0 | 5 | 0 | 61.61 | 76.7 | 5 | N | 16 | 11.247 | 29.189 | 29.985 |
| 1883..... | 33.72 | 63.0 | 3.5 | 19 | 0 | 0.77 | 2.0 | 8 | 0 | 46.24 | 68.8 | 2 | O | 21 | 13.680 | 29.199 | 29.612 |
| 1884..... | 23.54 | 59.6 | -6.5 | 19 | 6 | 2.56 | 6.5 | 8 | 0 | 66.34 | 80.0 | 1 | N | 18 | 10.015 | 29.189 | 29.660 |
| 1885..... | 32.54 | 57.0 | -1.5 | 13 | 1 | 1.25 | 10.0 | 7 | 0 | 53.33 | 69.9 | 1 | N | 12 | 11.669 | 29.177 | 29.538 |
| 1886..... | 21.03 | 58.0 | -6.0 | 23 | 4 | 0.83 | 2.0 | 6 | 0 | 37.77 | 73.4 | 0 | N | 11 | 12.170 | 29.254 | 29.768 |
| 1887..... | 28.13 | 60.0 | -8.0 | 17 | 4 | 2.08 | 3.0 | 6 | 1 | 53.92 | 80.2 | 3 | N | 23 | 12.070 | 29.147 | 29.779 |
| 1888..... | 34.78 | 62.0 | 7.0 | 12 | 0 | 1.78 | 3.0 | 6 | 0 | 41.29 | 74.4 | 0 | N | 9 | 11.750 | 29.185 | 29.598 |
| 1889..... | 44.78 | 72.0 | 11.0 | 2 | 0 | 0.08 | 0.0 | 2 | 0 | 47.89 | 76.3 | 5 | N | 25 | 12.380 | 29.110 | 29.679 |
| 1890..... | 35.98 | 67.0 | 15.0 | 10 | 0 | 1.00 | 4.0 | 2 | 1 | 33.39 | 80.3 | 2 | D | 23 | 12.800 | 29.214 | 29.677 |
| Mean..... | 30.40 | 61.9 | -4.6 | 16 | 3 | 1.53 | 5.2 | 6.0 | 4 | 50.10 | 73.2 | 1.5 | N | 12 | 11.805 | 29.197 | 29.684 |

SUMMARY FOR THE YEAR.

The year 1890 was one of the six warmest years upon our 23 years record, the thermometer having reached the zero point but twice during the year.

The rainfall was above the average, but an untimely deficiency in June and July was disastrous to the corn crop in nearly all parts of the State.

Some remarkable peculiarities of the year were the extremely low barometer of March 27th, which gave the lowest reading ever observed at this station, and the late date of the first autumn snow, which did not make its appearance until December 23d, 43 days later than the average date.

TEMPERATURE.

Mean temperature of the year, 54.10 degrees, which is 1.82 deg. above the mean of the 22 preceding years. The highest temperature was 100.5 deg., on July 14th; the lowest was 5 deg. below zero, on the 16th of January, giving a range of 105.5 deg. Mean at 7 A. M., 47.94 deg.; at 2 P. M., 62.45 deg.; at 9 P. M., 53.00 deg.

Mean temperature of the winter months, 31.99 deg., which is 3.06 deg. above the average winter temperature; of the spring, 52.55 deg., which is 1.17 above the average; of the summer, 77.84 deg., which is 2.33 deg. above the average; of the autumn, 54.02 deg., which is 0.55 deg. above the average.

The warmest month of the year was July, with mean temperature 82.76 deg.; the warmest week was July 8th to 14th, mean 85.12 deg.; the warmest day was July 14th, mean 88.47 deg. The mercury reached or exceeded 90 deg. on 43 days (three below the average number). Of these 43 hot days, 14 were in June, 21 in July and 8 in August.

The coldest month was January, with mean temperature 23.24 degrees; the coldest week was January 15th to 21st, mean temperature 13.56 degrees; the coldest day was January 15th, mean 6.12 degrees above zero. The mercury fell below zero on only two days, of which one was in January, and the other in February.

The last hoar frost of spring was on May 16th; the first hoar frost of autumn was on September 13th; giving an interval of 119 days, or nearly four months, entirely without frost. This is 36 days shorter than the average interval.

The last severe frost of spring was on April 1st; the first severe frost of autumn was on October 27th; giving an interval of 209 days, or nearly 7 months, without severe frost. The average interval is 199 days. No frosts during spring or autumn caused severe damage to crops of grain and fruit.

RAIN.

The entire rainfall, including melted snow, was 36.32 inches, which is 0.82 inch above the annual average. Either rain or snow, or both, in measurable quantities, fell on 84 days—17 less than the average. On 11 other days rain or snow fell in quantity too small for measurement. The rain of the afternoon and night of the 12th of October measured 4.42 inches, which surpasses any previous single rainfall on our record, except the 5.63 inches of August 12th, 1889.

The number of thunder showers was 24. On May 30th occurred the only hail storm of the year.

SNOW.

The entire depth of snow was 15.50 inches, of which 8 inches fell in January, 3 in February, one-half inch in March, and 4 inches in December. This is 5.8 inches below the annual average. Snow fell on 12 days, on 5 of which the quantity was too small for measurement. The last snow flurry of spring was on April 2d; the first snow of autumn was on December 23d—43 days later than the average date.

FACE OF THE SKY.

The mean cloudiness of the year was 42.67 per cent., which is 1.44 per cent. below the average. The number of clear days (less than one-third cloudy) was 170; half-clear (from one to two-thirds cloudy), 106; cloudy (more than two-thirds), 89. There were 78 days on which the cloudiness reached or exceeded 80 per cent. There were 54 entirely clear and 41 entirely cloudy days. The clearest month was July, with a

mean of 24.31 per cent.; the cloudiest month was February, mean 60.47 per cent. The percentage of cloudiness at 7 A. M. was 45.33; at 2 P. M. 44.76; at 9 P. M. 33.97.

DIRECTION OF THE WIND.

During the year, three observations daily, the wind was from the S. W. 240 times, N. W. 217 times, S. E. 163 times, N. E. 146 times, S. 129 times, N. 112 times, E. 54 times, W. 34 times. The south winds (including southwest, south and southeast) outnumbered the north (including northwest, north and northeast) in the ratio of 532 to 475.

VELOCITY OF THE WIND.

The number of miles traveled by the wind during the year was 133,589, which is 567 miles below the average for the preceding 17 years. This gives a mean daily velocity of 367.09 miles, and a mean hourly velocity of 15.29 miles. The highest velocity was 72 miles an hour, on January 11th from 12:05 to 12:10 A. M.: the highest daily velocity was 1,100 miles, on the 12th of April; the highest monthly velocity was 13,979 miles, in April. The windiest months were March, April and December; the calmest months were July, August and September. The average velocity at 7 A. M. was 12.75 miles; at 2 P. M. 13.39 miles; at 9 P. M. 13.77 miles.

BAROMETER.

Mean height of barometer column, 29.125 inches, which is 0.016 inch above the annual average. Mean at 7 A. M., 29.149 inches; at 2 P. M., 29.106 inches; at 9 P. M., 29.120 inches; maximum, 29.783 inches, on January 16th; minimum, 28.058 inches, on March 27th; yearly range, 1.725 inches. The highest monthly mean was 29.242 inches, in January; the lowest was 29.002 inches, in May. The barometer observations are corrected for temperature and instrumental error only.

RELATIVE HUMIDITY.

The average atmospheric humidity for the year was 73.8; at 7 A. M., 84.4; at 2 P. M., 58.1; at 9 P. M., 78.9. The dampest month was January, with mean humidity 81.9; the driest month was July, mean humidity 63.3. There were 25 fogs during the year, which number has been but twice exceeded, in 1884 and 1889. The lowest humidity for any single observation was 14 per cent., on April 11th.

The following tables give the mean temperature, the extremes of temperature, the number of inches of rain and snow, the number of rainy days, the number of thunder showers, the mean cloudiness, the relative humidity, the number of fogs, the velocity of the wind, and the mean and extreme barometer heights, for each month of the year 1890; and a comparison with each of the 22 preceding years.

YEAR 1890.

| 1890. | Mean temperature ... | Maximum temperature ... | Minimum temperature ... | Rain, inch & ... | Snow, inches ... | Rainy days ... | Thunder storms. | Mean cloudiness ... | Humidity ... | Number of fogs. | Miles of wind. | Mean barometer ... | Maximum barometer ... | Minimum barometer ... |
|---------------|-------------------------|----------------------------|----------------------------|------------------|------------------|----------------|--------------------|------------------------|--------------|-----------------|----------------|-----------------------|--------------------------|--------------------------|
| January | 27.43° | 63.6° | 5.0° | 2.50 | 8.00 | 3 | 0 | 57.04 | 81.9 | 3 | 11,580 | 29.242 | 29.783 | 28.652 |
| February | 32.55 | 65.0 | -1.5 | 0.75 | 3.00 | 7 | 0 | 60.47 | 79.0 | 3 | 10,924 | 29.156 | 29.681 | 28.679 |
| March | 37.79 | 76.0 | 4.0 | 1.02 | 0.50 | 8 | 1 | 54.23 | 70.8 | 5 | 13,580 | 29.140 | 29.663 | 28.654 |
| April | 56.62 | 89.0 | 29.0 | 2.51 | 0.00 | 9 | 3 | 52.94 | 69.4 | 1 | 13,979 | 29.110 | 29.494 | 28.581 |
| May | 63.23 | 89.0 | 39.0 | 5.14 | 0.00 | 12 | 2 | 42.42 | 68.9 | 0 | 12,057 | 29.002 | 29.300 | 28.662 |
| June | 77.02 | 96.0 | 52.0 | 2.12 | 0.00 | 6 | 6 | 34.72 | 73.3 | 0 | 10,737 | 29.039 | 29.387 | 28.715 |
| July | 82.76 | 100.5 | 59.0 | 1.56 | 0.00 | 5 | 3 | 24.31 | 63.3 | 1 | 9,427 | 29.054 | 29.205 | 28.859 |
| August | 73.74 | 99.0 | 55.0 | 6.19 | 0.00 | 12 | 5 | 34.79 | 74.0 | 2 | 8,449 | 29.105 | 29.172 | 28.819 |
| September .. | 63.11 | 89.5 | 37.0 | 5.62 | 0.00 | 9 | 1 | 51.67 | 74.8 | 1 | 9,191 | 29.162 | 29.494 | 28.834 |
| October | 54.85 | 80.5 | 28.5 | 5.35 | 0.00 | 6 | 2 | 36.59 | 71.9 | 6 | 10,870 | 29.053 | 29.406 | 28.676 |
| November .. | 41.09 | 68.0 | 21.0 | 2.56 | 0.00 | 5 | 0 | 29.33 | 73.9 | 1 | 10,395 | 29.222 | 29.695 | 28.753 |
| December ... | 35.98 | 67.0 | 15.0 | 1.00 | 4.00 | 2 | 1 | 33.39 | 75.7 | 2 | 12,800 | 29.214 | 29.677 | 28.437 |
| Mean | 54.10 | 81.9 | 28.0 | 3.03 | 1.30 | 7 | 2 | 42.67 | 73.8 | 2 | 11,166 | 29.125 | 29.508 | 28.644 |

TWENTY-THREE YEARS: 1868—1890.

| Year. | Mean temperature..... | Maximum temperature..... | Minimum temperature..... | Total days, Above 30 deg..... | Zero days..... | Days between 80 and 90 f..... | Rain, inches..... | Snow, inches..... | Early days..... | Thunder storms..... | Mean cloudiness..... | Humidity..... | No. of fogs..... | Miles of wind..... | Mean barometer..... |
|-----------|--------------------------|-----------------------------|-----------------------------|----------------------------------|----------------|----------------------------------|----------------------|----------------------|-----------------|---------------------|----------------------|---------------|------------------|--------------------|---------------------|
| 1868..... | 52.77° | 101.0° | -16.5° | 43 | 7 | 160 | 37.48 | 27.5 | 77 | ..... | 42.35 | ..... | ..... | ..... | ..... |
| 1869..... | 50.51 | 96.0 | -5.0 | 23 | 2 | 167 | 38.51 | 18.0 | 105 | 33 | 49.23 | 78.2 | 19 | ..... | 29.103 |
| 1870..... | 53.70 | 102.0 | -10.0 | 51 | 6 | 197 | 31.32 | 9.5 | 100 | 27 | 47.88 | 68.4 | 13 | ..... | 29.097 |
| 1871..... | 53.56 | 103.0 | -6.0 | 48 | 8 | 218 | 33.23 | 29.7 | 120 | 24 | 47.37 | 65.9 | 6 | ..... | 29.076 |
| 1872..... | 51.30 | 97.0 | -18.0 | 45 | 16 | 192 | 32.63 | 23.2 | 116 | 40 | 44.33 | 64.4 | 11 | ..... | 29.112 |
| 1873..... | 51.96 | 104.0 | -26.0 | 48 | 9 | 165 | 32.94 | 26.5 | 101 | 17 | 42.46 | 64.0 | 6 | 154,508 | 29.093 |
| 1874..... | 53.68 | 108.0 | -3.0 | 58 | 2 | 187 | 28.87 | 43.0 | 99 | 20 | 45.54 | 65.7 | 14 | 145,865 | 29.121 |
| 1875..... | 50.63 | 99.0 | -16.5 | 32 | 12 | 196 | 28.87 | 5.0 | 106 | 21 | 44.81 | 66.7 | 5 | 145,316 | 29.102 |
| 1876..... | 52.76 | 98.0 | -5.0 | 36 | 4 | 179 | 44.18 | 25.7 | 102 | 29 | 41.27 | 66.8 | 4 | 148,120 | 29.102 |
| 1877..... | 54.16 | 99.0 | -9.0 | 20 | 3 | 217 | 41.09 | 15.5 | 126 | 39 | 47.12 | 72.6 | 11 | 113,967 | 29.117 |
| 1878..... | 55.31 | 98.0 | -6.0 | 35 | 7 | 228 | 38.39 | 25.5 | 107 | 38 | 40.65 | 70.2 | 5 | 125,793 | 29.067 |
| 1879..... | 54.68 | 99.5 | -16.0 | 43 | 13 | 203 | 32.68 | 10.3 | 90 | 36 | 40.01 | 67.1 | 10 | 124,768 | 29.127 |
| 1880..... | 54.00 | 101.0 | -12.0 | 41 | 2 | 211 | 32.65 | 7.0 | 89 | 29 | 40.15 | 67.9 | 18 | 146,039 | 29.123 |
| 1881..... | 54.65 | 104.0 | -8.0 | 68 | 6 | 210 | 33.27 | 32.5 | 110 | 31 | 47.42 | 70.1 | 11 | 141,430 | 29.103 |
| 1882..... | 54.94 | 105.0 | -6.5 | 40 | 1 | 232 | 27.60 | 18.0 | 102 | 26 | 45.41 | 68.6 | 14 | 137,736 | 29.113 |
| 1883..... | 51.66 | 96.5 | -14.0 | 26 | 8 | 217 | 40.65 | 12.5 | 106 | 32 | 45.24 | 69.7 | 18 | 141,164 | 29.135 |
| 1884..... | 51.30 | 98.0 | -21.5 | 20 | 14 | 198 | 43.45 | 29.0 | 105 | 35 | 47.56 | 72.6 | 28 | 131,188 | 29.111 |
| 1885..... | 51.01 | 96.0 | -14.5 | 27 | 21 | 176 | 36.97 | 33.0 | 103 | 31 | 44.57 | 71.3 | 9 | 123,013 | 29.107 |
| 1886..... | 52.96 | 105.0 | -18.0 | 53 | 16 | 203 | 24.25 | 23.5 | 103 | 28 | 39.64 | 66.5 | 5 | 127,769 | 29.111 |
| 1887..... | 53.12 | 102.0 | -20.0 | 40 | 16 | 203 | 33.84 | 25.0 | 91 | 23 | 40.91 | 69.8 | 13 | 132,367 | 29.109 |
| 1888..... | 52.28 | 99.0 | -18.0 | 28 | 9 | 203 | 44.17 | 22.0 | 83 | 37 | 42.49 | 72.2 | 15 | 128,185 | 29.132 |
| 1889..... | 53.57 | 94.0 | -3.5 | 6 | 4 | 213 | 43.90 | 6.0 | 81 | 35 | 43.82 | 73.2 | 28 | 120,230 | 29.125 |
| 1890..... | 54.10 | 100.5 | -5.5 | 43 | 2 | 209 | 36.32 | 15.5 | 84 | 24 | 42.67 | 73.8 | 24 | 133,589 | 29.125 |
| Mean, | 52.36 | 100.2 | -12.2 | 39 | 8 | 199 | 35.54 | 21.0 | 100 | 29 | 44.04 | 69.4 | 12 | 134,531 | 29.110 |

SYNOPSIS OF THE PROCEEDINGS
OF THE
NATIONAL CONFERENCE OF STATE BOARDS OF HEALTH,
Nashville, Tenn., May 19-20, 1890.

The sixth annual meeting of the National Conference of State Boards of Health was held at Nashville, Tenn., May 19th and 20th, 1890. The first day's session was called to order in the State Senate Chamber, at 10 A. M., by the President, Dr. J. N. McCormack, of Bowling Green, Ky.

The roll of States was called by the Secretary, Dr. C. O. Probst, of Ohio, the following delegates responding:

LIST OF DELEGATES.

Alabama, Dr. Jerome Cochran; California, Dr. C. A. Ruggles; Connecticut, Dr. C. A. Lindsley; Illinois, Dr. John H. Rauch; Indiana, Dr. James T. Hibbard; Kansas, Dr. W. L. Schenck, Dr. H. D. Hill; Kentucky, Dr. J. N. McCormack, Dr. Pinkney Thompson, Dr. William Bailey, Dr. Geo. Beeler, Dr. I. O. McReynolds; Louisiana, Dr. L. F. Salomon, Dr. Fedix Formento; Michigan, Dr. Henry B. Baker; Missouri, Dr. Geo. Homan; Ohio, Dr. C. O. Probst, Dr. Thos. C. Hoover; Pennsylvania, Dr. Benjamin Lee; Rhode Island, Dr. Charles H. Fisher; South Carolina, Dr. A. D. Moore; Tennessee, Dr. J. Berrien Lindsley, Dr. J. D. Plunket, Dr. F. L. Sims; Texas, Dr. R. Rutherford; Vermont, Dr. C. L. Allen; Wisconsin, Dr. J. T. Reeve, Dr. B. O. Reynolds; Province of Ontario, Dr. P. H. Bryce.

On motion, the reading of the minutes of the preceding annual meeting was dispensed with.

The President delivered the following address:

ADDRESS OF THE PRESIDENT.

Gentlemen of the Conference: The health officials of this country are to be thanked, and the people at large congratulated, that no epidemic disease has had a widespread prevalence within our domains since the last general meeting of the Conference, in the spring of 1888. At the time of that meeting the existence of cholera in southern Europe, and the knowledge that this disease had never before prevailed as an epidemic in Europe without reaching, and more or less desolating, portions of our own country, caused a general and well-grounded apprehension of danger in the minds of both the sanitarians and people of this Union. Coast quarantine defenses were inspected and put in order with a vigilance and confidence hitherto unknown in their history, and no less interest was manifested in putting the cities and towns throughout the country in the best possible sanitary condition. It is believed by many of those best informed that it was largely a result of these precautions, and the care upon the part of our trans-Atlantic shipping and commercial interests

necessitated by them, that, for the first time in the history of this plague, it failed to reach our shores when once started upon its westward march.

Threatened similarly upon our south-Atlantic and Gulf coast from an invasion of yellow fever with each recurrence of the warm season, our confidence in the modern quarantine defenses at New Orleans, Charleston and Savannah, and especially at the first-named port, increases with each year in which they give us immunity from this dread disease. Indeed, the quarantine system at New Orleans, devised by our distinguished colleague, Dr. Joseph Holt, seems now to reach almost to perfection in that particular branch of our health service, giving the greatest immunity from contagion furnished by present scientific knowledge, and at the same time interfering to the least possible degree with commerce and trade.

From the inception of modern sanitation in this country, Florida furnished a weak and even broken link in the chain of our coast defenses against exotic plagues, and her officials and people manifested an indifference upon this subject hazardous to their own safety as well as that of the entire country. As a result largely of the bitter experience had with yellow fever in 1888, the Florida State Board of Health was created, and it will be our pleasure to welcome its delegates to the first of our meetings they have had an opportunity to attend. The new State of North Dakota has also recently established a State Board of Health. The development of this branch of service is almost without parallel in the history of government. The first State Board of Health was established in 1869, and in the short period that has elapsed since that time thirty-three other State boards have been created, and as the powers and appropriations first granted were judiciously utilized, these have been generally gradually extended by the respective legislatures from year to year. The creation of local boards of health in the various cities, towns, and counties, has been equally rapid and extensive, and to-day the official health service of the several States having State boards of health, at least theoretically, reaches to the most remote hamlet. This is equally true of the various Provinces of Canada, whose boards also have membership with us.

Both the State and local services are much more perfect and effective in some States and Provinces than in others, and a prominent object of this organization has been, and no doubt will long continue to be, a comparison of views and a discussion of the methods by which the best results may be attained. As the jurisdiction of the boards represented here extends over twenty-eight States and Canada, the importance of, and the necessity for, care in our deliberations can hardly be overestimated.

The rapid growth of commerce and trade between this country and Cuba and Mexico makes the cultivation of cordial relations between the sanitary authorities of these countries and our own a matter of yearly increasing importance, and I submit for your consideration the expediency and propriety of inviting the authorities of these countries to send delegates to our future meetings. The practical results of a similar invitation to the Provinces of Canada have been advantageous to both us and them, and there are many reasons, chiefly climatic, why such relations with Cuba and Mexico are even more important to us.

So far as can be learned, our system of interstate notification in regard to the existence of diseases dangerous to the public health has been very generally and satisfactorily observed. A recent experience had in the working of this system has convinced me that the information imparted by such notices may lead to injustice and misunderstanding between the authorities of adjoining States, without the exercise of constant care and good judgment.

In conclusion, permit me to thank you for the distinguished honor you have conferred upon me by electing and continuing me as your presiding officer for five

successive years. As there are many among you more entitled to this honor by years, by experience, as well as by eminence attained in the high calling in which we are all engaged, I shall expect you to select some one else to preside over your deliberations at future meetings.

ANNUAL REPORTS.

The first order of business was the consideration of a question proposed by the State Board of Michigan as to "The editing and printing of annual reports of State Boards of Health, and other methods of disseminating public health knowledge."

The discussion was opened by Dr. Henry B. Baker, Secretary State Board of Health, of Michigan, who spoke as follows:

This question was designed, I think, to bring to us in Michigan all the good advice that you had to offer on this very important topic, and the law in our State makes this "disseminating of public health knowledge" a very important part of the work of the State Board of Health. But inasmuch as good advice is included among the things which "it is more blessed to give than to receive," I may give you all I can think of on this subject. The first that occurs to me is the desirability of having the "running head" at the top of every right-hand page state the substance of the most important contents of that page.

Life is too short to make it profitable for most busy persons to work long to learn the contents of an official report. Every method which facilitates rapidity of learning the contents of the annual report, not only the titles of the papers, but the substance of them, seems to me very desirable. And the placing at the head of every other page the most important subject discussed on that page, is an important aid. The printers like to set up one line and repeat that on every page; but that does not make a report nearly so valuable as the method I recommend.

Secondly. I like the plan of having in every article which will admit of it, *sub-heads* at the commencement of each division of the subject of the paper.

Thirdly. In Michigan we have had considerable success in disseminating information useful in public-health work, and especially in creating an interest in such work by holding sanitary conventions in cities and villages, at which conventions subjects are discussed of special interest, in a sanitary way, to the locality where the convention is held. We hold from two to six each year, and find great good to come from this method of work.

Fourthly. The public press sometimes greatly aids our work in disseminating public-health knowledge. I think I can state the exact conditions under which the press aids us most: it is when we take the most care to *condense* facts of interest to the people into a short paragraph, which every newspaper has room for, and which most people will read because it is so short that it is about as easy to read it after the eye has once rested upon it as it is to skip it. I have in mind two or three such items that have gone through nearly every newspaper in our State, because much time and thought were given to the subject of condensing into a single paragraph the important point which it was desirable that our people should grasp.

Fifthly. We think our people derive great benefit from a method we employ for the dissemination of information useful for the restriction of the dangerous communicable diseases. We send to every locality where one of these diseases occurs, a number of copies of a pamphlet which gives concisely the best that is known for the restriction of that particular disease, and we ask the health officer to distribute these pamphlets to the neighbors of the family in which the disease is. They are

read by neighbors of a placarded house more thoroughly than by any other class of people, and the people thus learn how to restrict that disease.

The discussion was continued by Dr. C. A. Lindsley, Secretary State Board of Health of Connecticut; Dr. Pinkney Thompson, President State Board of Health of Kentucky; Dr. A. D. Moore, of the State Board of Health of South Carolina; Dr. W. L. Schenck, member of the Kansas State Board of Health; Dr. Benjamin Lee, Secretary of the Pennsylvania State Board of Health; Dr. P. H. Bryce, Secretary Provincial Board of Health of Ontario; Dr. C. H. Filber, Secretary of the State Board of Health of Rhode Island; Dr. Geo. Homan, Secretary of the State Board of Health of Missouri; Dr. J. D. Plunket, President State Board of Health of Tennessee; Dr. C. O. Probst, Secretary of the Ohio State Board of Health; Dr. J. S. Reeve, Secretary State Board of Health of Wisconsin; and Dr. J. H. Rauch, Secretary of the Illinois State Board of Health.

The discussion of this subject was very entertaining and instructive. This closed the morning session.

AFTERNOON SESSION.

The Conference was called to order at the appointed time, and entered into a discussion of the following query, proposed by the State Board of Rhode Island: "By what means can a proper comprehension of the principles and practice of hygiene be most effectually promoted?"

The discussion was opened by Dr. C. H. Fisher, of Rhode Island, who spoke as follows:

Inasmuch as that question was discussed in some measure this morning, it will be unnecessary for me to bestow much time upon it; in fact, I did not intend to do so under any circumstances, and the question was proposed, not with any idea that the proposer would be called upon to answer it, for it is not the usual way, I think, for one to ask questions and answer them himself; neither was it proposed because there were not ways enough to bring sanitary knowledge to the attention of the people, for they are numerous enough, and not because there could not be devised methods enough to employ the different ways; but in what way can sanitary knowledge be best impressed upon the minds of the people? That is, how can their attention be so engaged that they will study the subject and become acquainted with the principles which underlie sanitation and regulate its practice, personally and publicly? Now the difficulty with me in my State has been that I have not seemed to make the impression upon the public mind so that I could point to this one or that one and say: "He has become acquainted with the principles of sanitation and hygiene." I want to know how one can so engage the attention of the people and so impress their minds that they will feel that all their acts should be governed by their knowledge.

I think there should be fear, a wholesome fear, of a violation of hygienic laws extant among the people to impel them to personal hygiene and health, and by arousing public opinion lead to the establishment of sanitary surroundings such as may be had by authority of the legislature or municipality. I was convinced last winter of the importance of a thorough conviction of the necessity for public hygiene as well as private, because I endeavored to get a bill through the legisla-

lature devising methods by which some laws that we have on the statute book might be enforced. We have some good laws, but they are dead letters. There are no statutes which require imperatively that those laws should be enforced. A bill which I drew up in the beginning of the session in relation to the adulteration of drugs and foods and all the material that enters into the composition of food and drink, providing for the enforcement of laws already passed, was met by a large number of persons who were engaged in defrauding the people by furnishing them adulterated drugs, food and drink. The milk clause killed the bill. Though I may not be able to prove it, I may say that a paper was subsidized by these parties, and lawyers were employed by them, and when the bill came before the committee for a second hearing, these parties tested their ingenuity in showing why the bill was arbitrary and not in consonance with the Rhode Island idea of personal liberty, and the right of every man to do as he pleased. There was reluctance on the part of the committee to recommend the measure. A large dealer in milk was on the committee, and of course opposed it. It is very easy for persons to spend ten dollars defeating a bill when they can make a hundred out of it. Money can be raised to sustain every species of fraud, but nothing for sanitation.

I wish to learn from this Conference what is the best way to convince the people that sanitation is needed. Every individual should practice it, and public opinion should be aroused to urge on the authorities. I wish to learn some way in which this sanitary information may be riveted and clinched in the public mind. There has been a good deal done in Rhode Island in the way of public works that was in the direction of the promotion of sanitation. As I said this morning, a dozen years ago there was only one town which had a public water-supply; now more than half of them are supplied, and many sewers have been established. I do not take it that the influence of the Board has done all this, or even a large part of it. The people have had furnished them documents setting forth the advantages of pure water and the removal of garbage. One town procured a water-supply, and you know that we are imitative creatures, and this may have led to others, and I hope the influence may continue; and so it is with sewerage. Many of the circulars which have been distributed have been extracts taken from the annual reports relating to the ventilation and construction of school-houses. I have had many letters from teachers asking for information on this point, and I have referred them to books where they may learn what they desire. I am glad that I can refer any teacher to half a dozen works that will aid him in learning what he wishes to know in the direction of sanitation. I hope there will be a large response to this question.

Dr. Rauch, of Illinois, said:

I have had some experience with regard to sanitation, and my advice to the Doctor is, try again. The time will come when he will succeed. It is impossible to secure legislation if there are men in the legislature, or on the committees, whose interests are of an opposite character. My advice is, try again. There is no royal road to doing anything. You have to take the time and circumstances. Occasionally you can get a legislature to do what you want them to, but not always. As to educating them, that amounts to nothing, and I think it scarcely worth while to discuss the question.

The discussion of this question was very profitably continued by Dr. Rutherford, State Health Officer of Texas; Dr. C. A. Lindley, Secretary of Connecticut State Board of Health; Dr. J. N. McCormack, Secretary of Kentucky State Board of Health; Dr. H. D. Hill, member of the Kansas State Board of Health; Dr. Formento, of Louisiana; Dr. Lee, of Penn-

sylvania; and Dr. Henry B. Baker, Secretary of the Michigan State Board of Health.

The Conference took up the consideration of the following question proposed by the State Board of Kentucky:

Resolved, That upon the outbreak of yellow fever or other epidemic disease rendering the establishment of quarantine necessary, this Conference urges such coöperation in administration on the part of threatened States as will confine the disease to the point of initial attack, in place of the expensive, unscientific and unsatisfactory so-called quarantines at distant State lines.

Resolved, That this Conference urges upon the health authorities of each State the importance of such an administration of any quarantine they may establish as will furnish proper protection to, and show due regard for the rights of States lying beyond them.

The discussion was opened by Dr. Pinkney Thompson, of Kentucky, who said:

I can readily see and comprehend that these two resolutions, if carried out, are of the greatest importance, at least to State and local authorities.

In the establishment of a quarantine in an outbreak of yellow fever, cholera, or any other disease, the coöperation of the adjoining States is of paramount importance. The trouble that I have seen among the boards, especially in the Southern States, is that in case of an outbreak the health authorities of other places are apt to conclude that the authorities where the disease exists are not doing their duty, and they set in themselves. I don't believe that I know of a single exception in many cases in the last twelve years where something of that sort has not occurred, and it was because of a want of proper appreciation on the part of one Board of the power and authority of the other, and an ignorance of what those authorities were doing. I know this was the case when the yellow-fever outbreak occurred at Memphis. The boards in a number of States, Kentucky included, were not satisfied with the quarantine regulations at Memphis. It was expressed by Illinois that they did not have confidence in the men below them, although they at that time knew nothing about it themselves—they were not there and were not going there. There was a case of yellow fever in Kentucky. I could not see how they could confine that disease to that locality, and the fact is that they did not do it. But we have increased in our coöperation until I believe it can be done. It was certainly to a great extent confined to Jacksonville in Florida. It was confined to a locality in Alabama, and it was confined to Jackson, Mississippi, when it broke out there. I do not think the extent of the coöperation should be the establishment of a quarantine at the State line, for instance, between Mississippi and Tennessee, or Alabama and Tennessee. It does no good in the world except to prove a nuisance and an incumbrance. I think the health authorities of those localities ought to be held responsible for letting people escape that they know are infected.

We should have the confidence and coöperation of other boards, and in my judgment trusting them and realizing that we are looking to them for protection is the most efficient way of preventing the spread of disease—not quarantining against them. In 1879 the quarantine was put down so thick along these railroads that every little town had a quarantine. When the Sanitary Council of the Mississippi Valley got into coöperation with the State Board of Louisiana, and got them to understand that we were in sympathy with them, and were looking to them for protection, we got it. There has not been an epidemic in New Orleans since 1878. It takes a system of coöperation without interference. This interference of one

board with another is what gets up trouble. We had a case of measles in east Kentucky, and the secretary of the Board telegraphed to the adjacent States that there was a supposed case of small-pox there. The State Board of Tennessee telegraphed Dr. Hamilton to send some one there to investigate it and protect their State. The Tennessee State Board never heard of it. There was a panic, which spread all over the neighborhood, and I think it did more harm than if we had never had government interference. What could Dr. Hamilton have done if he had found it small-pox? He could not have done anything unless the Governor had done like they did in Florida—tell the National Government that the cost was too great for the State to undertake. Of course the Government did interfere down there, and rightly and promptly; but Alabama did not tell the Government that the State wanted it to interfere at Decatur, nor did the people of Jackson ask the Government to send anyone down there. What does a marine hospital fellow know about small-pox in the country? I think we should adopt this resolution in a shape that is called for by a due respect for the opinions, integrity and honesty of those who have these outbreaks to deal with. If I had not had confidence in New Orleans I would have told them that their boats should not come up the river, but I had it.

As to the second part of the resolution, I think it is a proper matter for this Conference to urge. It should insist that no State or local board should establish a quarantine until they can ascertain from the authorities where the disease is, what measures are taken to control it, and confine it to its locality. If they endeavor to get up a panic about it they do more harm than good, and render coöperation that is mischievous. If I heard there was a case of yellow fever in New Orleans, I would not quarantine against that place until I knew something about the matter, nor do I suppose that Louisiana would quarantine against a case in Kentucky upon a rumor. If there was a case in Galveston I don't suppose that Louisiana would quarantine against the whole State of Texas. I want our coöperation to be of the nature that those on the ground think we ought to render; but if the coöperation means that we are going to interfere with each other because of lack of confidence, I say, break up the business and let each State care for itself.

The discussion of this subject was very ably conducted by Dr. Plunket, Dr. Rutherford, Dr. Salomon of Louisiana, Dr. Cochran of Alabama, Dr. Hibbard of Indiana, Dr. Bailey of Kentucky, Dr. Bryce of Ontario, and Dr. Moore of New York.

REPORT OF THE COMMITTEE ON LEPROSY.

Dr. Lee (Secretary of the State Board of Health of Pennsylvania), chairman of the Committee on Leprosy, read the report of that committee as follows:

GENTLEMEN: The undersigned, appointed a committee at the last meeting of the National Conference of State Boards of Health to consider the subject of leprosy in its relation to the United States, beg leave respectfully to report: That since the date of their appointment, the investigations of competent observers in India, the Hawaiian Islands and the West Indies, have been carefully studied, and the chairman has visited the Island of Cuba in order to satisfy himself as to the actually existent condition in that nearest focus to this country. The principal works consulted have been those of Archdeacon Wright, entitled "Leprosy and its Story; Segregation its Remedy;" of Wellesley C. Bailey, Esq., B.C.S., entitled "A Glimpse at the Indian Mission Field and Leper Asylums;" of Archdeacon Wright, entitled "Leprosy an Imperial Danger;" of Mr. Edward Clifford, entitled

"A Visit to Father Damien;" and of Dr. W. Munro, of Manchester, late Medical Officer at St. Kitts, West Indies, entitled "Leprosy." The committee desire to express their especial obligations to Mr. Wellesley C. Bailey, Secretary to the Mission to Lepers in India, for his kindness in furnishing them the latest and most reliable information from English sources.

The moot point at the bottom of this investigation is, of course, the contagiousness of the disease, and the committee would here put on record their profound conviction, if ever a learned society committed a blunder which was near akin to a crime, it was the Royal College of Physicians of England, when, in order to gratify the vanity of a few doctrinaires and glorify the great British doctrine of free trade in disease, as well as in all other commodities, it adopted the report of the committee which declared leprosy non-contagious, and then stamped with the seal of its immense authority the most damnable medical heresy of modern times. The complete apathy which followed the promulgation of this declaration in all parts of her Majesty's dominions with regard to the segregation of the disease was as astonishing in fact as it was mournful in its results. All precautions were thrown to the winds. Barriers between the clean and the unclean were broken down. And now, mark! The first of the two works of Archdeacon Wright, to which I have alluded, was published in 1885, the second in 1889. In the former he reports the number of lepers in British India at 120,000, in the latter at 131,618, according to the official returns, but adds that those who know India well, place it at not less than 250,000, while many contend that half a million would scarcely cover the number of these unfortunates. And here let me say, parenthetically, as a fact which comes very near home to us, that Dr. Leloir, clinical professor of diseases of the skin at Lisle, and author of a "*Traité Pratique et Theorique de la Lepre*," expresses the belief, as the result of his observations and inquiries, that there are more lepers in proportion to the population, in the West Indies, than in the East Indies. Such are the consequences of the non-protective policy in leprosy. Now let us glance for a moment at an experiment in the opposite direction. The government of Norway, where the disease was an actually present evil, did not allow itself to be carried away by the new-fangled theory of the English Dermatologists. On the contrary, it not only continued to keep its leper population under the strictest surveillance, but added new restrictions, making the segregation of a leper compulsory, absolute and permanent from the moment of the discovery of the disease. Here again note the result: In the year 1857 there were in Norway, at the beginning of the year, 2,863 cases, while 242 new cases were discovered during the year. In the following year, the number had fallen to 2,794, with 235 new cases. In 1860, the number reported was 2,819, with 226 new cases. Ten years later it had fallen to 2,619, with 160 new cases, and ten years after that to 1,717, with only 29 new cases. Thus in twenty-three years the number of lepers has been reduced from 2,863 to 1,717, while the number of new cases has fallen from 242 to 29, a diminution of eight-ninths, indicating with mathematical exactness the possibility of its complete extinction at no distant day.

In view of this positive demonstration from both sides of the question, namely, the rapid extension of the disease when a full intercourse is allowed, and its as rapid diminution when the isolation is insisted on—in view of the fact that most reliable and painstaking observers who have personally watched the disease in all its phases for years, not getting their knowledge afar off, and by hearsay, have almost universally abandoned the doctrine of the heredity of the disease, and moreover have proved by the most careful experiments that it is very rarely conveyed by inoculation—the Royal College of Physicians certainly owes it to humanity and to the medical profession, in whose sacred name it speaks, to recant this heresy in the plainest language and the most complete manner.

It is not enough that, stimulated by the interest shown by the Prince of Wales as President of the "Father Damien Memorial Fund," the College should urge the Government to "institute a full and careful scientific investigation of a question which in the interest of humanity calls for immediate attention." There is no time to waste in a useless and long-drawn-out scientific investigation. There is ample information on which to base an opinion, and that opinion exactly the reverse of that to which the College has already given world-wide expression. Common honesty requires that it should confess its mistake as publicly as it made it. The extent to which this dogmatic utterance on the other side of the ocean has dominated medical opinion in this country, is indicated by the fact that since the last meeting of this Conference a number of the most prominent physicians in Philadelphia have united in publicly rebuking the Board of Health of that city for enforcing its regulations for the reporting and segregation of the disease.

Before considering the subject in its intimate relation to this country, let us glance for a moment at the present distribution of the disease throughout the world. In Europe, we find it, as already said, in Norway, to an extent which has compelled the Government to exercise the most careful measures for the segregation of its victims. In Sweden, a few cases are known to exist. In Iceland, there are about one hundred cases. In Russia, it is making its way stealthily along the shores of the Baltic, in Esthonia, Livonia, Gourland, Finland, Cherson, the Crimea, and among the Cossacks of the Ural, being prevalent in the Caucasus, the Delta of the Volga and Astrakan. A few lepers are found in Austria. They abound in Constantinople and are found in Macedonia, Thessaly, Crete, and other parts of the Sultan's dominions. The disease is decidedly on the increase in Greece and the Archipelago. A few lepers are found in Malta; in Italy there are a few cases in every public hospital and not less than a hundred in the Island of Sicily. In Spain they are scattered over all the southern provinces, Catalonia, Valencia, Andalusia and others, making it necessary to establish leper hospitals at Granada and Malaga. The mountainous district of Lafoes, in Portugal, contains a large number, and there is a leper house at Lisbon. In France it has its fixed home in the Rhone district, along the shores of the Mediterranean, and at Nice, and fresh cases are constantly occurring in families previously unaffected. Traveling eastward, we find it in Asia, as follows: Lepers swarm in Arabia, Syria, and Palestine. Jerusalem has a leper hospital. It is very common in Persia. In Asia Minor its presence is evidenced by the fact of a leper hospital at Scutari. We have already alluded to its immense prevalence and fearfully rapid spread in British India, under the fostering care of the Royal College of Physicians. In Indo-China we meet it extensively in Burmah, Siam and Malacca, and not less so in the French colonies. In China proper the lepers are almost innumerable. Leper-houses are as common as they were in England four hundred years ago, and that is saying much. In the city of Canton alone, there are between three thousand and four thousand cases. They are numerous in Japan, the Indian Islands, Kamschatka, and the Aleutian Islands.

Proceeding now to the great dark continent, on which our illustrious compatriot has been recently throwing a ray of light, we find many in Egypt, Abyssinia, Darfur and Senegambia, and on the coast further south many, with an alarming tendency to increase at the Cape of Good Hope; some on the west coast, and in the Islands of Madeira, the Azores, St. Helena, Madagascar, and Mauritius. In the Pacific, we find it in the Sunda and Philippine Islands, and the fearful story of its introduction and rapid spread in the Sandwich Islands, until every fifteenth of the population is a leper, is familiar to us all. Chinese and Indian immigration has introduced it into Australia. Still continuing across the Pacific, we find it firmly established in California, whose representatives in this conference gave us timely warning at the

last meeting. Lepers are numerous in Mexico, Central America, Ecuador, Venezuela, Uruguay. They are numerous in French and British Guiana. Leprosy is rife in many provinces of Brazil, hospitals being found in five different cities. The Antilles are full of it. Jamaica contains from seven hundred to eight hundred lepers. In Barbadoes, the population has increased six per cent. while lepers have increased twenty-five per cent. In the North-American continent we already find cases of the disease in Greenland, in New Brunswick, and in British Columbia; and in the United States—in Minnesota, Wisconsin, Michigan, Oregon, South Carolina, Louisiana, Texas and Florida, and as before noted, in California.

We are warranted, therefore, in the assertion that leprosy is cosmopolitan. No pent-up Utica confines its powers. It makes naught of latitudes or of altitudes. It spares no age and respects no race. The Anglo-Saxon, the Teuton, the Slav, are susceptible to its contagion as well as the Hindoo and the Sandwich-Islander. Witness Father Damien, so long the show card of the non-contagionists, now lying in a martyr's grave under the frowning shadow of Molokai. Let us not take refuge in a fancied immunity due to climate or parentage. They will prove but broken reeds to pierce us as we lean upon them. We have, as has been shown, leprosy to north of us, leprosy to south of us, leprosy to east of us, leprosy to west of us. We have even a few centers of infection within our borders. These, however, are as yet insignificant. If proper precautions are taken, they will cease to exist in the course of a generation. In view of the situation, what is the part of wisdom? Two courses are open to us. First, the do-nothing policy which has prevailed until nearly the present time. The result of this will be that in fifty years there will be lepers in every hamlet, and leper-houses crowded with their mutilated victims in every city. Second, the policy of absolute and implacable segregation in the case of those who are already fairly domiciled in the country, the prohibition of marriage to all lepers, and the prohibition to all uninfected persons of the inhabiting of infected houses; and with regard to foreign lepers, the policy of absolute and implacable exclusion. With the adoption of these measures, which undertaken at this time will entail very little hardship and will not be difficult of execution, there are those now living who will see the day when there shall not be a leper in the land.

How shall the principle of segregation be practically carried out? Those who have given the subject the most careful study believe that careful investigation would bring to light lepers hiding in every State in the Union. Shall every State then establish a leper-house? Common-sense cries out against such an absurdity. Shall each State set apart a leper-ward in a general hospital? Humanity forbids the incurring of such a risk. One, or at least two colonies, would accommodate all the lepers on the east side of the Rocky Mountains, and the same number would be sufficient for those on the other side. Such a colony already exists in Louisiana. There are lepers enough in Wisconsin and Minnesota to warrant the establishment of one in that section of the country. Let those States deed the land occupied by these leprous communities, or which may be set apart for them, to the United States, and let every leper, no matter what his wealth, or his social position, be removed to one of these colonies. Let every provision be made for the care and comfort of the colonists, but let the separation of the sexes be absolute during the genetic period of life. To every house in which lepers have lived, which is not within the limits of the colony, let the torch be applied; or should this be impossible, let the most thorough disinfection be employed, not forgetting the Mosaic precaution of scraping the walls.

How shall the policy of absolute and implacable exclusion be carried out? It is probably safe to say that there are not half a dozen physicians in the United States who would recognize a case of leprosy in its earlier stage. But in order to make

quarantine effective it is essential that there should be an expert in leprosy at every port of entry, at which passengers arrive from infected countries. If the Government cannot find such, it should select men for the purpose and send them to Havana to study the disease. All immigration from leprosy countries, and all Americans who have been domiciled in leprosy countries, as, for instance, the Sandwich Islands, should be stripped, and every inch of their bodies subjected to the most rigid scrutiny. In prompt compliance with a suggestion made at the last meeting of the American Public Health Association, the Supervising Surgeon General of the United States Marine Hospital Service has issued an order looking toward the exercise of a rigorous quarantine against this disease, of which the following is the text:

To Medical Officers of the Marine Hospital Service, Collectors of Customs, and others concerned: The National Quarantine Act approved April 29, 1878, entitled "An act to prevent the introduction of contagious or infectious diseases," provided that no vessel or vehicle coming from any foreign port or country where any contagious or infectious disease exists, or any vessel or vehicle conveying persons or animals affected with any contagious disease, shall enter any port of the United States, or cross the boundary line between the United States and any foreign country, except in such manner as may be prescribed.

Attention is now directed to the increased prevalence of the contagious disease known as leprosy in several foreign countries, and the danger of its increase in the United States through the immigration of persons affected with leprosy, and by direction of the Secretary of the Treasury the following regulation is framed under authority of the foregoing act, subject to the approval of the President, to protect the people of the United States from the introduction of leprosy.

1. Until further orders, no vessel shall be admitted to entry by any officer of the customs until the master, owner, or authorized agent of the vessel shall produce a certificate from the health officer or quarantine officer at the port of entry, or nearest United States quarantine officer, that no person affected with leprosy was on board the said vessel when admitted to free pratique, or in case a leper was found on board such vessel, that he or she with his baggage has been removed from the vessel and detained at the quarantine station.

2. Medical officers in command of United States quarantines are hereby instructed to detain any person affected with leprosy found on board any vessel, but such officer will permit the departure on out-going vessels of persons detained at quarantine in pursuance of this regulation, provided such vessel shall be bound to the foreign country from which the said leper shall have last sailed.

JOHN B. HAMILTON.

Approved:

Supervising Surgeon-General, Marine Hospital Service.

WILLIAM WINDOM, *Secretary.*

Approved: BENJ. HARRISON.

[From Dominion Report of Department of Agriculture for 1889.]

A very interesting report on the Leprosy Lazaretto at Tracadie, N. B., is given by Dr. A. C. Smith, the visiting physician at that institution. He reports twenty persons suffering from that disease and at the Lazaretto, five new cases having been admitted since the last report, and three deaths having occurred during the year. Leprosy he states is dying out in Tracadie, but as cases were reported appearing in the neighboring institutes, Dr. Smith made a special tour of inspection, which resulted in his finding a focus of the disease between Caraquet and Shippegan, and he traced from this center several cases to other settlements. He strongly urges permanent measures of segregation as the only means of stamping out this loathsome disease. It would appear from the tenor of his report that there is some reluctance on the part of persons in suspected houses to allow the inspecting physician to enter them for the purpose of examination, and he strongly urges legislative action to assist segregation of the disease, not only in the interest of those living in affected districts, but to prevent the spread of leprosy, a subject forcing itself on the attention of the world at large.

I. CARLING, *Member of Agriculture.*

Dr. Knut Hoegh wrote a minority report of the Committee on Leprosy, which was presented by Dr. Reeve. This subject was very thoroughly discussed by Drs. Bryce, Salomon, Ruggles, and Reeve.

Dr. Lee offered the following resolution:

Resolved, That this Conference respectfully requests the President of the United States to instruct the Secretary of the Treasury to amend the rule of a recent law

for preventing the spread of contagious diseases from one State to others, so as to limit the operation of such rules and regulations to such States as may, through their constituted health authorities, ask for national assistance for their own States.

The resolution by Dr. Lee was carried.

NIGHT SESSION.

The Conference was called to order in the Maxwell House, at 8:00 P. M.

The following question, proposed by the State Board of Health of Michigan, was taken up: "To what extent is it necessary to moisten the air of rooms at the time sulphur is burned for the purpose of disinfection after the occurrence of diphtheria, scarlet fever, and small-pox?"

The discussion was opened by Dr. Bryce, who said:

I was considering this afternoon the amount of moisture which would be necessary with an ordinary given number of grains of sulphur to make H^2SO^3 , or sulphurous acid, which is the active agent in the disinfecting process. I find if we take one grain of sulphur and convert it into sulphur dioxide, we would have exactly the same amount, of course double, as would equal two molecules of air; in other words, one-half of air would form the acid with sulphur dioxide. If you carry that calculation through, and assume that the humidity of the air of the room is about 75 per cent. of saturation, raising the temperature 20 or 30 degrees Fahrenheit—which is as high, I suppose, as burning sulphur would raise it—would reduce the humidity to $1\frac{1}{2}$. You have one-half the moisture necessary in the air, and half a grain of water would be necessary to every grain of sulphur, which would mean that one-fourth the amount of sulphur dioxide fumes in the air would have to be supplied in the shape of vapor of water. If the vapor of water were supplied in a room in the shape of a very fine spray, reaching far up, and if the sulphur dioxide fumes could come readily into contact with it, it seems to me that taking five pounds of sulphur to an ordinary room, you would require about one-fourth of five pounds, in other words, one and one-half pounds of water, to fulfill all the conditions. In the ordinary process of disinfecting a room one of the difficulties is, that water is put on to such an extent as to destroy a great deal of the furniture. With a small nozzle or fine syringe you could supply a pound of water in the shape of fine spray, which would remain in suspension long enough for the sulphur dioxide fumes to come in contact with it. It would be a desirable precaution to brush down the room walls and ceiling with an ordinary brush with five parts in a thousand of per chloride of mercury, thereby destroying all the germs that might not be reached by the ordinary sulphur fumes, if there were a layer of dust. So that if the walls were brushed down thoroughly with per chloride and spray applied, I don't see why one part of water to every five of sulphur would not fulfill the scientific conditions. If there were curtains and things of that sort which were not removed, it might take more water with the sulphur fumes to reach every point.

Four or five years ago we had some two hundred cases of small-pox in thirty houses. We treated each house in succession, burning such clothing as was of little value, the other clothing being thrown into a solution of probably two parts of the thousand of per chloride of mercury. The blankets and quilts were left in this twenty-four hours. The room was washed down with the hose and thoroughly cleansed with the per chloride. After that, all the doors and windows were tightly closed and a pot of burning coals placed in the center of the room, and about five pounds of sulphur for the thousand cubic feet of air space was set burning. The

result was satisfactory—not a case of infection growing out of these thirty or forty houses in subsequent months. It must not be forgotten, however, that all the native population were vaccinated, and we must assume either that strangers coming into the houses were vaccinated, or the houses were thoroughly disinfected. I think that in houses where there has been small-pox, scarlatina, or diphtheria, washing down the walls and cornices with per chloride, putting in a certain amount of moisture in the air with an abundance of sulphur dioxide, will be found sufficient to thoroughly disinfect the rooms. It will be remembered that at the American Public Health Association in Brooklyn, statements were made in regard to disinfecting houses by burning sulphur, and the results were said to be satisfactory. While that may be true in many cases, I do not think we should risk infection by burning a little sulphur in a pot or stove in the room.

This subject was very freely discussed by Drs. Rutherford, Ruggles, Lee, Rauch, and Hill.

The President announced the following question, proposed by the State Board of Kansas: "Is it not both important and very desirable for all State Boards of Health to have a uniform system of blanks for the reports of vital statistics?"

Dr. Thompson said:

The laws in the States are different, and a blank that would work in Connecticut might not in Texas; and so on. It does not matter how we get our information, so we get all we want. What we want to know is, a person's nativity, sex, age, and cause of death. In many cases the law prescribes the kind of blank that shall be used, and the State Board of Health, if it should recommend another blank, could not enforce its use.

Dr. Cochrane said:

I cannot agree with the gentleman who has taken his seat. I differ from every statement that he has made. It is difficult to collect vital statistics at all, but if you are able to collect them at all, you are able to prescribe the form of the certificates and the items that you wish to know. We are trying to collect these statistics in Alabama, where the matter is under the control of the State Board of Health, which prints the certificates and distributes them throughout the State, so that every birth or death that is reported is intended to be reported according to that one common system, and we have a good many items of information to gather that the Doctor has not mentioned. One of the chief values of our figures is that we may be enabled to make comparisons with other States, and that we may do this it is important that our reports should be gotten up in something of a like manner.

Dr. Hibbard said:

I have had some little experience in this matter, and I am glad to hear Dr. Cochrane say that the value of statistics lies mainly in comparison. Whatever is in them is to be obtained by comparison, and to this end we should ask the same questions in the same way, and put them in the same form, if we are to use them to their full advantage. There is no room to discuss the proposition at all. It is a self-evident fact that blanks should be the same.

Dr. Rauch said:

We had a meeting several years ago at Washington at which this question was discussed thoroughly. The forms prepared by myself and used in Illinois were made in accordance with the action taken there, and unless the blanks are uniform

the work amounts to nothing. Unless you can draw comparisons with other localities and other States, much of your work amounts to nothing. The value of uniformity cannot be questioned.

Dr. Reynolds said:

It is not worth while to discuss this question, because we are discussing an impossibility. In my State the statutes govern the form in which reports shall be made. A penalty is provided for non-conformity with the law in this respect, and how are thirty-five States to get uniform laws? [A member of the Conference suggested that the question was, whether uniformity was desirable or important.] I think it would be well for them to be so, but it would take a life-time to get them so. I think these things will regulate themselves. If we ask the legislature to make a change they may abolish the whole matter in doing so. If the figures are obtained, a mathematician can draw his conclusions and comparisons.

Dr. Salomon said:

We are not asking for uniformity in statutes. The question is simply one which is in the power of every State and local board of health. They all get up their own forms for reports of deaths and births, and it is simply in these reports of vital statistics to the different State boards that the desirability for uniformity exists. I think this is an important question, and one which is self-evident. If we can get uniformity in our reports, it makes the matter of comparison much more easy.

Dr. Baker said:

I think it would be a waste of time to discuss vital statistics here. There will be found men on both sides of the question of strong views, and I will ask postponement of my report until other business is disposed of.

The Conference took up for consideration the question proposed by the State Board of California: "How to prevent contamination of potable waters."

Dr. Ruggles began the discussion as follows:

The importance of California's question is evident. We are peculiarly situated in that State. There is not a State in the Union that is more poorly sewered. We talk about our fine climate and ask you to visit us, but I will say that there is but one town in the State that is properly sewered, and that is San Diego. San Francisco has a death-rate of 23 every month in the year, and sometimes more, with Oakland and Sacramento but little behind; and this is on account of bad sewerage. That implies contamination of water. The earth is honey-combed with water-closets, cess-pools, etc.; their contents percolate into the surrounding earth, and contamination of our drinking-water results. We have in Stockton a system of well-digging that is, perhaps, novel. Our wells are bored. We have a stratum of clay, which we call hard-pan. This is as impervious to water as rubber, and is found six or eight feet below the surface. We bore, say twenty feet into the gravel, and put in pipes of galvanized iron, which protects, so long as they last, the water from contamination from the surrounding ground. But the pipes become oxidized, and in four or five years look as if they had been riddled with buck-shot. Our water is contaminated by the water-closet and cess-pool arrangement, and our State Board is trying to educate the people to the necessity of protecting themselves by establishing, as far as possible, more effective sewerage. The little town I live in is wrestling with the sewerage question, and will decide it on the 10th of next month, and I am sorry that I shall not be there. Our system has been improved by Col. Waring, the best

sanitary engineer in the United States, and we hope to improve matters considerably. I can offer no solution to that question other than to remove the cess-pool and water-closet as far from the drinking-water as possible, and that can be done only by a perfect system of sewerage. I was pleased with that portion of the Ohio law which says that the cess-pool shall be eight inches thick, of brick, and hermetically tight. If we cannot get good sewerage, the next best thing is those hermetically sealed arrangements. We must have water and must have it clean.

The discussion of this subject was very interestingly conducted by Drs. Reeve, Bailey, and Lee.

The next question discussed was that proposed by the State Board of Ohio: "Should State Boards of Health have executive powers?"

Dr. Baker discussed the subject as follows:

If by the term "executive powers" is meant the executing of certain functions, for the performance of which State boards of health are needed, then I think that, beyond question, State boards of health should have "executive powers." They should execute all such laws as these:

1. For the collection of statistics, and all facts and information useful for the preservation of life and health.

2. They should execute laws designed for the creation of *new knowledge*, for original research, by means of laboratory experiments, and by experiments such as those undertaken by the Massachusetts Board, to learn concerning the filtration and purification of water, the disposal of sewage, etc. I regard it as very desirable that they should be able to investigate directly and thoroughly into the causation of diseases. Water-supply, sewerage, etc., are general subjects influencing somewhat many diseases. I would be glad to see State boards of health execute laws designed to secure the study of the causation of each important disease, such as consumption, diphtheria, scarlet fever, typhoid fever, and yellow fever, so that all the factors in the causation of each disease might be known, absolutely and minutely, and consequently their prevention might be much easier, and more certain. I believe that if this were done, we would very soon be able to teach our people just *how to prevent the greater part of all such diseases*, as rheumatism, neuralgia, erysipelas, diarrhea, pneumonia, bronchitis—in fact, all of the most prominent diseases that now cause the great bulk of the misery, mortality, pauperism, and some proportion of the crime in this country. We are able to teach how and to prevent small-pox, diphtheria, scarlet fever, and typhoid fever. I believe we may now also add that most important of all diseases, consumption.

3. I would have, as one important part of the laws which all State boards of health should execute, thorough provision for the *dissemination* of all this knowledge useful for the preservation of life and health. The best methods which the highest social science can devise should certainly be made available for this purpose. The best minds should devote their highest efforts and best energies, for years to come, to the subject of how to get to the people, who* "are destroyed for lack of knowledge," that knowledge which is able to save them from degradation and death. This, in brief, is my suggestion of how State boards of health *should* have "executive powers." According to my ideal, the State board of health is a grand power *for the advancement of human knowledge*, for the noblest of all purposes, the betterment of the physical, mental and moral condition of all mankind. I believe that "*knowledge is power*." How shall we best get the most of it? How shall we best impart it to all our brothers who need it? But I think the question which I have

* Hosea: Chapter IV, verse 6.

been asked to discuss has reference also to a subject quite different from the one I have been discussing—that there is in the minds of some people an idea that State boards of health should be mainly great and powerful for the abating of some nuisance. dealing with nuisances, large or small, but nuisances which no *local* board of health has abated; nuisances, also, which no local board can abate; that the State board of health should have mandatory powers to compel obedience to its own views of public sanitation, to its own interpretation of public-health laws, many of which laws are enacted because of, and are based upon results of investigations made by State boards of health. Is this desirable? I think it is not. I believe in local self-government. If the State board has to do the work of the local boards it cannot do much that it should do and which cannot be done by the local boards. I believe that we should teach the localities to take care of themselves, and if they don't do it, let them suffer.

The President asked Dr. Baker what he would do in cases where the disease had reached such dimensions that the local authorities could not control it.

Dr. Baker replied: "Such a case occurred in our State a year ago last winter, and the State supplied the funds, and the epidemic was stamped out. I regard that, however, as simply a make-shift, and not a constant thing. That has occurred only once in the last seventeen years, and in that instance we did what Dr. McCormack suggests—the State took hold and stamped the disease out."

Dr. Rutherford: "And wasn't it short, sharp and decisive?"

Dr. Baker: "It did not last a great while."

Dr. Lee: "If such an emergency were to occur more frequently would not you exercise the power the State gives you in this respect more frequently?"

Dr. Baker: "I don't know. The call for it has occurred many times over in another way. Small-pox is an insignificant disease compared with some others. We have lost many people by diphtheria and scarlet fever, yet public sentiment would not support any interference on the part of the State Board in such cases, when it would in small-pox outbreaks. I am speaking on the general principles of the functions of State boards of health, as I have stated them."

Some one asked if the State board should not come in and say how the work should be done when the local authorities believe that they are doing all that is necessary, and are really doing very little at all.

Dr. Baker replied as follows:

Our board has no mandatory powers. Recently there was an outbreak of small-pox at Meridian, and, under the impression that it was chicken-pox, free mingling and riding on the cars was permitted. We do not wait for health authorities to notify us of outbreaks of diphtheria and scarlet fever, but search the newspapers. For where you will find one local officer that is prompt to report you will find many others that are not. What we do is, not to step in and stamp out the disease, but insist that they shall stamp it out; and if they do not, put the prosecuting attorney after them and try to find out why. We undertake to devise so that the local board shall do the work, and they do it after a while. They sometimes fail to do it, but

when the people find that the State board will not go there, but that the local board is empowered to do it, they change their administration and have new officers at the next election. We find out about an outbreak from the newspapers and send a demand for a report. If it is not forthcoming we set the machinery in motion to compel it.

The discussion of this subject was very ably conducted by Drs. Lee, Cochrane, Lindsley, Bailey, Rauch, Rutherford, Formento, Salomon, Bryce, Thompson, and Baker.

Dr. Reeve offered the following resolution, which was adopted:

Resolved, As the sense of this Conference it is desirable that the executive officer of each State Board of Health should send to the executive officer and to each member of every other State Board of Health, copies of each of its annual reports, public health circulars or other publications, and also to furnish for the library of every other State Board of Health, a copy of each of the above-named publications.

Dr. Homan offered the following resolution concerning the organization of local boards of health, which was carried:

Resolved, That the President of this Conference be instructed to appoint a committee who shall formulate a practical plan for the creation and organization of county and other local boards of health in the several States, the said committee to report at the next meeting of the Conference.

The President appointed Dr. Henry B. Baker of Michigan, Dr. C. A. Lindsley of Connecticut, and Dr. Benjamin Lee of Pennsylvania, as members of this committee.

The President said the executive committee thought an assessment should be made upon the different boards sufficiently large to cover the cost of getting out the minutes, and any outstanding indebtedness.

Dr. Probst stated that \$10 per board would likely cover all expenses.

Dr. Bryce moved that an assessment of \$5, in addition to the usual assessment of \$5, be levied. The motion was carried.

Dr. Lee introduced the following resolution, which was adopted:

Resolved, That the Secretary be instructed to address a communication to the Secretary of the Bureau of Health, or other appropriate health authority of the Island of Cuba and Mexico, inviting them to participate, either personally or by representatives, in our next annual Conference.

The election of officers for the ensuing year was entered into. Elections by ballot were decided upon. The vote for President was announced, showing Dr. McCormack to be reelected. He made an attempt to decline, but the election was made unanimous.

Dr. Baker said that a better Secretary than the one who had served the past year could not be gotten, and he moved that the Conference instruct Dr. Rutherford to cast the vote of the body for Dr. Probst as Secretary. The motion was unanimously carried and acted upon.

The Conference adjourned.

TUESDAY, MAY 20—MORNING SESSION.

The Conference was called to order at 9 o'clock, and presided over by Dr. Bailey, Dr. McCormack not being able to be present.

Dr. P. H. Bryce, Secretary of the Provincial Board of Health, Toronto, Ontario, read the following paper on "Preservation of our forests as a national sanitary need," with the request for a full discussion:

PRESERVATION OF THE FORESTS AS A NATIONAL SANITARY NEED.

Mr. Chairman, and Gentlemen: Says Madame Michelet, "Alas, in how many places is the forest, that once lent us its shade, nothing more than a memory! The grove and noble circle which so fittingly adorned the mountain is every day contracting. . . . Who will eloquently set forth their manifold mission, and their active and incessant assistance in the regulation of the laws which rule our globe? Without them it seems delivered over to the blind destiny which will again involve it in chaos. The motive powers and purificators of the atmosphere through the respiration of their foliage; avaricious collectors to the advantage of future ages of the polar heat, it is they, too, which arrest the progress of the sea-born clouds and compel them to refresh the earth; it is they which pacify the storm and avert its most disastrous consequences. In the low-lying plains, which had no outlet for their waters, the trees, long before the advent of man, drained the soil by their roots, forcing the stagnant waters to descend and construct at a lower level their useful reservoirs. And now, on the abrupt declivities they consolidate the crumbling soil, check and break in the torrent, control the melting of the snows, and preserve to the meadows the fertile humidity which, in due time, will overspread them with a field of flowers."

I might have quoted much more of the delicate yet comprehensive and vigorous description given by this accomplished writer regarding her friends, the trees and flowers, but we have in what has been given a text sufficiently comprehensive for me to base a sermon upon much longer than the time which is here allotted would permit. It is, however, upon two points which have been touched upon in the words quoted, that I propose here especially to dwell. One deals with the direct protective influences of forests, as regards human life, and the other the indirectly conserving influence they exert in preventing the drying up of our watercourses, whether surface or subterranean.

1st. The direct protective influence of forests on human life: Residing within the favored magic circle of the great lakes, of 100,000 square miles in extent, and watching in the telegraphic dispatches of the day the records of the cyclones and floods, with their accompanying horrors, which from time to time occur to the south and west, it has sometimes seemed to me as if I dwelt in a sea-girt island, secure as is that little ocean gem, separated from all external foes, which both you and I can look to as the parent of our race. Perhaps it has been this very position, within the periphery created by the great lakes, that has made me so sensible of the difference between our climatic conditions and those which have made Johnstown, Louisville and Akron horrors possible, and yet, as I have witnessed the work which, within a quarter of a century, has made the cultivated portions of Ontario treeless to the extent of seventy-five per cent., I tremble lest Scripture should be fulfilled in our case, and the sins of the fathers visited upon the children, even to the third and fourth generations. It is not recently only that this question has engaged my attention, as that of many other observers, in the matter of its influence upon climate

and rainfall, but it has been only recently that its disastrous effects on human life have made themselves strongly felt by me.

If, in barbaric days, the Greeks considered it unpardonable to cut down the olives in an enemy's country, it ought not to seem strange should we view with alarm the wanton devastation which has denuded the vast areas of Canada and the States east of the Mississippi of the bulk of their magnificent forests, and where, through carelessness, we are too frequently allowing generous Nature's second gift in the new growth to go uncared for, to suffer similarly from the ravages of fire and cattle. That the total rainfall of many of our districts has not greatly altered in its annual amount, seems tolerably well established; that its distribution throughout the year has been wholly changed, however, is indubitable.

The following summary of calculations, made by me some years ago of the rainfall at the Toronto Observatory, amply illustrates these statements:

| TOTAL SNOW AND RAIN. | |
|----------------------|----------------|
| 1840-41..... | 216.57 inches. |
| 1850-54..... | 164.681 " |
| 1860-64..... | 160.387 " |
| 1870-74..... | 152.62 " |

Or, between the 1st and 4th periods there was a total decrease of 63.95 inches, or a yearly difference of 12.79 inches.

The total moisture is divided as follows:

| TOTAL RAINFALL. | |
|-----------------|-----------------|
| 1840-44..... | 191.020 inches. |
| 1850-54..... | 137.999 " |
| 1860-64..... | 131.706 " |
| 1870-74..... | 113.150 " |

Or, between the 1st and 4th periods there was a total decrease of 77.87 inches, or a yearly difference of 15.35 inches.

| TOTAL SNOWFALL (12 INCHES SNOW, 1 INCH RAIN.) | |
|---|----------------|
| 1840-44..... | 322.70 inches. |
| 1850-54..... | 320.10 " |
| 1860-64..... | 344.33 " |
| 1870-74..... | 473.83 " |

Or, between the 1st and 4th periods there was a total difference of 151.13 inches, or a yearly increase of 12.59 inches.

These calculations agree exactly with theory. In comparing the individual quarters of each period, I arrived at the following results: March has remained much the same; with April is found a decrease of more than half an inch, a decrease that increases with each month until September, thus:

| | April, May, June. | July, August, September. |
|--------------|----------------------|-----------------------------|
| 1840-44..... | 48.55 | 68.101 |
| 1850-54..... | 40.195 | 48.625 |
| 1860-64..... | 32.742 | 45.617 |
| 1870-74..... | 34.670 | 35.14 |

The significance of this unpleasant change must be evident to all. Further, the average temperature of the two months of germination is lower now than it was forty years ago. Thus:

| | March. | April. | May. |
|--------------|--------|--------|--------|
| 1840-44..... | 29.85° | 42.62° | 51.22° |
| 1850-54..... | 30.24 | 40.05 | 50.68 |
| 1860-64..... | 29.02 | 40.80 | 52.86 |
| 1870-74..... | 27.24 | 48.18 | 53.36 |

This undoubted fact causes what is termed a late spring, the period for growth and development of the plant being shorter than formerly. The temperature

of May, the first month of real growth, is now warmer than formerly, by an average of nearly two degrees. The growth is thus apparently forced unnaturally to make up for loss in April, but the attempt is rendered futile by undue dryness, the rainfall in May having been:

| | |
|--------------|----------------|
| 1840-44..... | 15.015 inches. |
| 1850-54..... | 13.675 " |
| 1860-64..... | 14.055 " |
| 1870-74..... | 8.640 " |

Allow me to use these figures to illustrate the fact which, judging from what we saw during our long journey yesterday through the Kentucky and Tennessee valley, has made, I imagine, itself felt in the South as well.

If we endeavor to bring these figures into relation with the fact of the enormous destruction of our forest areas, the following conclusions seem to be established:

By the month of March the rays of the crescent sun are beating more directly upon the snow-covered ground than is possible where there is a large tract of forest. Hence the snow melts much more rapidly away now than formerly. But much worse than this, the rapidly-melting snows do not, as water, sink silently away, in large part into the leaf-mould and humus, which formerly covered the areas in the forest, and, previous, absorbed as effectively as a sand-dune will, the superincumbent waters. Thus the double evil is created, of rapid melting and rapid flowing away. Falling on bare hillsides, even heavy clays are eroded, and watercourses are formed, which, swelling at every moment, rush to the creeks and larger streams, piling up the water in such a way as can only be appreciated by gentlemen who have lived along the lower levels of your Mississippi and your Ohio. Some of you here must have seen sights similar to that I noticed as commemorated on the buttress of a ruined bridge over the Cumberland—high-water mark for 1882 being some forty feet above low-level datum. Houses, lands, families desolated, and malaria reaches left behind, has been, and is to-day the Nemesis which Pan and his Dryads have decreed shall fall upon men who, with sacrilegious hands, have destroyed the sylvan temples and fanes consecrated to the worship of the shepherd god.

But nature, thus prodigal, like him of our Scripture lesson, has, while rioting rejoicing in her strength and freedom from winter's embrace, exhausted her substance, and the waters having run their wanton course, have left the hillsides ragged and bare to parch and bake, and to become as drear and still as Niobe, robbed of her children. Such, all of us recognize, as facts in those limited areas of country coming within our ken; but if one thinks for a moment that, with a rainfall in the month of March of say four inches, much of which may fall, in the north or in the mountains further south, on frozen ground, every three acres—over hundreds of miles of gathering-ground on the mountains and slopes—is capable of yielding one foot deep of water, we can obtain a clear idea of what such must mean, heaped into the valley of the Cumberland within a few days, and how incalculable is the loss to what otherwise would be permeable beds, holding up their stores of water to supply through the thirsty summer, springs, bursting from the hillsides as messages to those who will hear of the limitless gifts of nectar which are to follow, or can be gathered by those who seek after them.

But there is much more than this. These more or less treeless surfaces become, during the long summer days, greatly elevated in temperature, and meeting atmospheres of other temperatures, set up disturbances resulting in water-spouts, cyclones, hail-storms, etc. Now, if we interpose the influence of a tree area, we find that the differences between ascensional currents over land and lake become less accentuated. Though the tree exposed to the summer sun does become elevated by solar heat, yet

the rise is slower and never reaches that of the bare soil, for several reasons: First, the green foliage is not so good an absorbent of heat as say a dark soil. Second, since the tissues of the tree are full of sap, and since the specific heat of water is about four times that of the soil, the sap will not rise in temperature so rapidly as will the soil. Third, on account of the circulation of the sap, successive volumes of water are being presented to the sun's influence in the leaves, but as the rapidity of circulation is increased with the heat, and as the sap coming from the deep earth must have a comparatively low temperature, the elevation of the whole volume of sap will be necessarily slow. Fourth, the much greater evaporation taking place from the leaves of the tree than could from the area of soil covered by it, creates a coolness of the surrounding atmosphere by the increased evaporation. This cooler and more nearly saturated atmosphere surrounding the tree intercepts the rays of the sun, and acts in the double capacity of a blanket and a parasol.

Now, reverting for a moment to the soil beneath the tree, we at once see that, protected from the sun its pores will remain open to absorb the soakage-water received into the numerous interstices of the leaf mould lying on the surface. Once into the soil, kept friable by the mulching of the surface and the penetrating roots, the waters follow along or are absorbed by the spongioles, and often impermeable clays are pierced by these roots reaching out for food, and the waters allowed to filter downward into some bed of sand and gravel, and so add to the water-stratum or supersaturated layer of permeable soil, which, dipping more or less along the underlying rock, often becomes the unlimited source of artesian water-supply to cities or towns hundreds of miles distant, in the direction of the dip of such rock strata.

I have now reached the other point I proposed to refer to, viz.:

Second: The indirectly conserving influence the forests have in maintaining the permanency of springs and deep watercourses. The mode by which an aggregation of trees acts in retaining the rains in the places they have fallen has already been explained, but I shall do little more than indicate the extent of this. Hofmann tells us that in an ordinary subterranean water-stratum the movement of the water along in the direction of the dip of strata is not much more than a metre a day. Apart from gravity the same rate would prevail in an upper permeable stratum, if saturated, but saturation of dry soil is a slow process. A clay will hold seventy-five per cent. of its own volume of water; a sand, twenty-five to thirty-five per cent. Now, water falling upon an upper permeable bed descends till, meeting a harder stratum, it follows the line of descent. There it crops out on the hillside, or, following the dip, passes under an impervious bed of clay, which, tapped by a boring, may ascend to a considerable extent, or even the whole of the length, or higher, of the pipe.

Should, through the absence of trees on the upper gathering-ground of such strata, a large portion of the annual rainfall flow off the surface and not be retained, it needs no prophet to predict what will be the future fate of such a source of public water-supply if largely drawn upon.

How important its preservation becomes is manifest from two considerations: 1st. That owing to the facts already stated, the streams, after the spring floods, are so rapidly reduced in volume as to yield most uncertain supplies where creeks are impounded, while at the time that their volume is being so greatly decreased, the growth of urban population tends constantly to increase the impurities in streams which are used for public water-supplies. These facts are slowly forcing themselves upon the attention of our towns and cities, but when it is remembered that from Cincinnati, southward, turbid river waters are supplied to the cities, it becomes apparent that practical knowledge in regard to underground sources of water-supply

is yet limited. On the other hand, when it is remembered that in the statistics of public water-supplies, as given by a New York engineer, over fifty per cent. of the public waters are pumped from wells of some sort or other, it is apparent that the subterranean waters will be in the future, much more than the superficial, the source to which we shall look for our drinking-water. This for three reasons: 1st. Because of its absolute biological purity. 2d. Because, when drawn from deep borings it maintains a great constancy of supply. 3d. Because, if conserved at the base of supplies by forests on the hillsides and uplands there will be more of it than in open channels on the surface over the same area.

Now, gentlemen, what practical application can this conference give to these facts, stated in the most partial and fragmentary way? We have seen the devastating effects of winds sweeping over treeless prairies, and of mountain torrents rushing unchecked, sweeping away the unsuspecting inhabitants below; we have seen the decline in the summer levels of streams, and in the increase of the streams' pollutions; and we behold the almost universal demand in all the territory inland from our great lakes for water from subterranean sources. We cannot ignore the fact that in this, as in all sanitary matters, no national confine or 49th parallel, no State line and no municipal boundary can limit to any extent malign influences due to general causes far-reaching in their operation. Why it should have been we know not, but so the Almighty has ordained it that in this matter the North shall give unto the South; that far to the north in the swamps of Minnesota and other western territories, the Father of Waters is born, as mountain streams,

"——which, swift or slow,
Draw down Eonian hills, and sow
The dust of continents to be,"

receiving its tribute from those streams, followed by our LaSalle as the thread through the labyrinth which could bring him to the light, fed by those now turbid floods of La Grande Rivière, rising high in many a shorn gulch of the Alleghanies, endangering the commercial life of Cincinnati, Louisville, and other towns, and later, nurtured by your own Cumberland, among many others, at times a minister of peace, and again as the personification of the spirit of evil. But whether these foes are without or within, they are all still of one household, and it surely is a matter of national solicitude, of State concern and of individual interest, that the strongest possible representations be made through the press, and by forwarding resolutions and using personal influence with legislatures, national and local; with bodies, commercial and scientific, with a view towards initiating, as in France, in Germany, in Austria, in England, in India, and in Australia, some broad and comprehensive scheme for nationalizing all the territory of the great watersheds, of appointing with extended executive powers, Federal and State forest officers who shall survey the whole areas, lay out reservations where needed to protect valleys and their towns and cities, and for encouraging and extending the work already initiated by many intelligent and progressive agriculturists, that of a general tree-planting and cultivation. Why should we not see on this continent the adoption of what has elsewhere become a source of national and individual wealth, of common pride and general safety — tree-planting as a science, an art, and as a pastime?

Dr. Formento discussed the paper as follows:

I think the question Dr. Bryce has discussed is one of vital and national importance, and we are all familiar with the terrible cases of inundation which have resulted in a great measure from the cutting away of the forests in the north. From a sanitary and humanitarian point of view I think it is important that this

Conference should take some action with regard to this subject, and after the discussion is over I shall propose a resolution embodying such views as I think proper.

Dr. Plunket said he thought the whole Mississippi valley needed some action on this subject, and he moved that a committee of three be appointed to formulate some resolutions bearing upon the subject.

The motion was carried, and the chair appointed on the committee Dr. Bryce, Dr. Formento, and Dr. Plunket.

Dr. Lee said:

I wish to express the great gratification with which I have listened to this paper. We in Pennsylvania have suffered probably as much as any other State in the country from the denudation of our hills and the destruction of our forests. It has gone on in the Alleghanies to a most frightful extent, and the results have been only too patent in the floods of the last two or three years. The possibility of the production of cataclysmal downfalls of water from the clouds in place of the usual rains, by the exposure of large surfaces which should be covered by forests, is well known; but there is one point which is suggested by the paper that has not been so generally brought out, and that is the fact that these denuded surfaces are the cause of disastrous cyclones and movements of the atmosphere. This is an important point, and one which is comparatively new. I would suggest that individual members of the Conference may do much by encouraging forestry associations in their respective States and communities; and I think every member of this Conference should be a member of a local forestry association, and do all in his power to promote its objects. It may not be known that the Congress of the United States has this subject at present under consideration, and that a special committee of forestry, which is a sub-committee of the Committee on Public Domains, has the matter in charge. There is a bill before Congress looking to the protection of forests on our public lands. If this subject is not referred to in the resolution offered by the committee, I will ask leave to introduce a supplementary resolution bearing upon it.

The Secretary read a letter from Dr. Young, resigning the chairmanship of the Committee on Codification of State Health Laws.

Dr. Lindsley moved to accept Dr. Young's tendered resignation, but Dr. Rauch said that Dr. Young was a good man for the work, and would probably report with a little encouragement, and the motion was withdrawn and the committee continued.

Dr. Fisher, of the Committee on the Collective Investigation of Diseases, stated that no member of the committee had found time to give to the preparation of a report, and that the disposition of the committee rested with the Conference.

The committee was continued.

The report of the Committee on Vital Statistics, by request, was held over.

The Secretary read a communication from Dr. Young, in reference to the time of meeting, which was, on motion of Dr. Rauch, laid on the table.

Dr. Ruggles read the following resolution from the State Board of California:

Resolved, That it is the sense of the California State Board of Health that, for the better promotion of Sanitary Science in these United States, the meetings of the

Conference of State Boards of Health be amalgamated with the meetings of the American Public Health Association, as part of said Association—the cost of attendance upon both meetings, as now ordered, being a burthen which distant States are unable to meet, owing to the lack of funds placed at their disposal for such contingencies; and that our delegate be instructed to advocate and support the said resolution before the Conference adjourns.

Dr. Rauch said: "To the older members of the Conference the question raised is a familiar one, and would result in trouble. The same action should be taken with it as with Dr. Young's paper."

Dr. Bailey said: "The action of the last Conference practically disposed of the matter."

Dr. Salomon said: "The question has been fully discussed at previous meetings, and can only lead to a long discussion. I think we can safely trust the time and place of meeting to the Executive Committee. They might call a meeting previous to either the American Medical or Public Health Association. I think the committee is competent to exercise its discretion in regard to that, and the Conference can always have its meeting a day or two in advance and independently of the others. As for amalgamation, that is out of the question."

Dr. Ruggles said: "In introducing this resolution I am acting under instructions. It has not been my privilege to attend this meeting before, and if this is the largest that you have had I am certainly sorry to see the absence of so many prominent States. I had hoped to see a delegation here from Massachusetts, which is my native State, but there is none; and if we from the Rocky Mountains are here, there are other States that ought to be present, and if interest could be increased it should be done by some means. It was suggested at the last meeting of the American Public Health Association that a certain section devoted to State medicine could be organized, and this body could occupy that. If this is an increase on the past, it is hoped that the future will be better. If the State boards will unite, California will be here every time."

Dr. Ruggles's resolution was received without action.

Dr. Bryce offered the following resolution, prepared by the Committee on Forestry:

Resolved, That, recognizing the well-known evils resulting to the whole nation from the disastrous floods which within recent years have taken place along the valleys of our great rivers, and from the destructive cyclones which from time to time occur, both of which evils have been pointed out to be due mainly to the cutting down of the forests on the mountains and along the hillsides, where our great rivers take their origin, and to the violence which the wind-storms obtain blowing over great tracts of practically treeless prairie, this national conference of health officers desires most earnestly to bring these evils to the attention of our Federal Government, our State and provincial legislatures, and other scientific and commercial bodies, urging them to take such comprehensive action as will (1) cause a survey to be made of the gathering-grounds of our great rivers; (2) preserve and replant, when necessary, these areas with protective forest trees; (3) establish schools whereby

the principles and practice of forestry will be taught, and protect by the most stringent legislation the results of the above-mentioned work; (4) make recommendations to our towns and cities to form park associations for the planting of trees and obtaining possession of waste lands, to be gradually reforested.

(Signed) P. H. BRYCE.
F. FORMENTO.
J. D. PLUNKET.

The resolution was adopted.

Dr. Lee offered the following supplemental resolution, which was adopted:

Resolved, That this Conference respectfully urges upon the sub-committee on forestry of the Committee on Public Domains of the Congress of the United States, to pass such laws as shall check the reckless destruction of trees on the public lands.

On motion of Dr. Salomon, the Secretary was instructed to forward a copy of the above resolutions to the Congressional sub-committee which had the forestry matter in charge.

Dr. Formento exhibited a plan which the Louisiana State Board had adopted of fumigating vessels with all danger of fire from burning sulphur removed, by means of generating sulphur gas, and made the following remarks:

I thank the Conference for its expression of confidence in the Board of Health of Louisiana. I beg leave to say that our Board appreciate their sentiments, and to assure the Conference, with all due modesty, that the Louisiana Board is worthy of their support and confidence, being composed of prominent physicians and citizens having but one ambition—the promotion of public health of their own State and of the whole Mississippi Valley. All their efforts will tend to secure one common object, and to establish relations of harmony and friendship between the boards of health of adjoining States. We consider our first and foremost duty to be to keep out foreign pestilence, yellow fever particularly. We have at our command an admirable system of quarantine, combining the scientific principles adopted and indorsed by the highest sanitary authorities. "Holt's Maritime Sanitation," with such improvements as time and experience have suggested, and will suggest in the future, is the system of quarantine strictly and impartially enforced by our Board; our main factors for the disinfection and fumigation of ships, their cargoes, crews and passengers, are heat, dry and moist—bi-chloride solution and sulphurous acid gas, with a reasonable period of detention (five days), not too hard on commerce. All avenues, whether by land or water, will be diligently guarded.

Dr. Lee said that he felt that local boards who are doing their best to handle leprosy should receive the support of the Conference, and at the risk of being considered a nuisance, would offer the following resolution:

Resolved, That it is the sense of this Conference that all the State and local boards of health should keep all cases of leprosy existing in their respective districts under surveillance, and should require physicians to report all cases of the disease which may come to their notice.

The resolution was adopted.

The Conference adjourned its sixth annual session.

SUPPLEMENT

TO THE

REPORT OF KANSAS STATE BOARD OF HEALTH, 1890.

STATE SANITARY CONVENTION.

Proceedings, Addresses and Discussions at the Fifth State Sanitary Convention, at Manhattan, Kas., Dec. 4-5, 1890.

[This report of the convention is prepared from papers furnished by the authors from accounts of the convention printed in the Manhattan and Topeka papers, and from notes by George F. Thompson, Esq., of Manhattan, and Dr. J. W. Redden, of Topeka, secretaries of the convention.]

This convention was held under the auspices of the State Board of Health, arrangements having been made by a local committee of the citizens of Manhattan, acting with a committee of the State Board of Health. The following were the local committees:

Committee on Entertainment—O. Huntress, Esq., Chairman; W. C. Johnson, Esq., Prof. O. E. Olin, Dr. G. A. Crise, and Dr. C. F. Little.

Committee on Arrangements—Dr. L. J. Lyman, Chairman; Capt. George K. Spencer, Dr. J. Robinson, Prof. F. A. White, and Hon. F. L. Irish.

Committee on Music—Prof. A. B. Brown.

Committee from the State Board of Health—W. L. Schenck, M. D., Topeka; D. C. Jones, M. D., Topeka; J. Milton Welch, M. D., Wichita, and J. W. Redden, M. D. Topeka.

The following-named gentlemen were elected as officers of the convention:

President—Hon. John G. Mohler, Salina.

Vice-Presidents—Hon. J. H. Mechem, of Mankato; President Geo. T. Fairchild, of Manhattan; Hon. Henry Elliston, of Atchison; Prof. John M. Bloss, of Topeka; Dr. H. S. Roberts, of Manhattan; Hon. T. M. Carroll of Paola; Hon. R. A. Sankey, of Wichita; Hon. C. F. Johnson, of Oskaloosa; Dr. H. F. Hamilton, of Douglass; and Hon. John C. Rankin, of Quenemo.

Secretaries—Geo. F. Thompson, editor of the *Nationalist*, Manhattan, and J. W. Redden, M. D., of Topeka.

Among those present were:

Prof. George T. Fairchild, of Manhattan; Prof. John M. Bloss, of Topeka; Dr. H. S. Roberts, of Manhattan; Judge R. B. Spilman, of Manhattan; George F. Thompson, Esq., of Manhattan; Dr. J. C. McClintock, of Topeka; Dr. Frank Swallow, of Valley Falls; Geo. E. Hopper, Esq., of Manhattan; J. W. Redden, M. D., of Topeka; J. W. Jenney, M. D., of Salina; Rev. D. C. Milner, D.D., of Manhattan; Col. Wm. Tweeddale, of Topeka; H. C. Irish, Esq., of Manhattan; D. C. Jones, M. D., of Topeka; Prof. W. S. Mayo, of Manhattan; Prof. G. H. Failyer, of Manhattan; R. A. Williams, M. D., of Olathe; Prof. Nellie S. Kedzie, of Manhattan; Prof. J. D. Wal-

ters, of Manhattan; M. J. Lyman, M. D., of Manhattan; J. Milton Welch, M. D., of Wichita; Capt. George K. Spencer, of Manhattan; J. Robinson, M. D., of Manhattan; ex-Gov. James Harvey, of Junction City; Prof. F. A. White, of Manhattan; Hon. F. S. Irish, of Manhattan; O. Huntress, Esq., of Manhattan; Prof. O. E. Olin, of Manhattan; W. L. Schenck, M. D., of Topeka; W. C. Johnson, Esq., of Manhattan; Prof. A. B. Brown, of Manhattan; Dr. C. F. Little, of Manhattan; Prof. Kellerman, of Manhattan; Prof. Hougham, of Manhattan; Dr. G. A. Crise, of Manhattan; besides many of the prominent citizens, ladies, professors of the Agricultural College, and students.

The various sessions of the convention were largely attended by ladies and gentlemen of the city, by professors and students of the College; all of whom took a deep interest in the convention, and many took part in the discussions of the different topics.

FIRST SESSION.

MANHATTAN, December 4, 1890.

The fifth annual State Sanitary Convention met in G. A. R. Hall at 7:30 o'clock P. M. In the absence of the President, Hon. John G. Mohler, Dr. H. S. Roberts, Vice-President, presided.

Rev. E. S. Riley offered prayer, and Mrs. H. Pearl Dow sang a solo.

The address of welcome was then given, by Judge R. B. Spilman, of Manhattan, as follows:

This is an era of conventions. Conventions, representing all sorts of ideas, and made up of all sorts of men and women, are of weekly — possibly I might truly say, of daily occurrence, somewhere within the limits of even our own State.

In some of these conventions the underlying idea is the promotion of the purely selfish interests of those who compose them, or of those whom they represent; in others, the prominent idea is the promotion of the welfare of the public at large, and those engaged in them are benefited only in common with others. Whatever their ultimate object may be, the promoters of these conventions generally seek to attain that object, to a greater or less extent, by striving to educate the people up to their ideas on the particular subject about which they are exercised, and this they try to do by the promulgation of those ideas in such popular form as shall attract public attention and set the people to thinking about, and eventually induce them, some of them at least, to receive those ideas and act upon them. The published programme tells us that this is a sanitary convention. Therefore, judging by its name, it belongs to that general class of conventions which seek primarily to promote the interests of the whole people, rather than of those who may take an active part in its meetings. The dictionary tells us that "sanitary" means pertaining to health; a study of the derivation of the word teaches us that the radical idea embodied in it is soundness, from which we may infer that health is a condition resulting from soundness; and carrying the idea further, we deduce the conclusion that a human being possessed of a sound body, with all of its organs performing their respective functions perfectly, in due time and order, and without interfering with each other in their work, will have health. And it logically follows that if he can keep his body in that condition, that is, if he can prevent everything from without or within from destroying its condition of perfect soundness, he will always, in

common parlance, enjoy good health. We may believe that the body of Adam—made by God himself, into which He breathed the breath of life and it became a living soul—was absolutely sound, perfect in all its parts; and that the body of Eve, formed also by Almighty power, from that of Adam, was also perfect. Whether any other human beings have had bodies of perfect soundness, we may not know; certain it is that physical perfection is rarely if ever found in the human race in these days, and that as far back as the lamp of history throws its light the question in regard to the human body has not been, Is it sound? but, To what extent is it unsound? The forces which sap physical strength and tend to physical unsoundness are largely from without, and the efforts of students of the science of human life have for a long time been put forth in the direction of discovering the causes of the diseases which prey upon mankind, or, in other words, the causes of physical unsoundness, and of some means of destroying those causes or of preventing the evil results which they produce when unhindered in their work in and upon the human system. Thus has grown up a department of human knowledge and research called “sanitary science;” and from a consideration of the work of scientists, physicians and philanthropists we get the full scope of the broad idea embodied in the word which gives this convention its distinctive name, namely, the preservation of public health by the prevention of disease. Sanitary science—otherwise called hygiene—has been well defined to be “the art of preserving health; that is, of obtaining the most perfect action of body and mind during as long a period as is consistent with the laws of life. In other words, it aims at rendering growth more perfect, decay less rapid, life more vigorous, death more remote.”

Short of showing sinful man the way to obtain eternal life, no nobler work can engage the earnest thought and labor of human minds and hands; and it is a work which arrests and holds the attention of all sorts of people; for what human being is there, who, if he cares not for his own bodily welfare, is not anxiously careful for the health of some one near and dear to him? No event of modern times has aroused a deeper public interest than the recent discoveries of Dr. Koch, the result of his long investigations as to the cause and possible cure of one of the most destructive of all the forces which are warring against human health and human life. And with what eager longing does the world wait for the result of experiments now being made, to learn whether one more triumph has been gained by science over disease.

In the interest and for the promotion of sanitary science in the State of Kansas this convention has been called. In the grand and philanthropic work which is the end and aim of this science, you who are to take part in the proceedings of this convention are engaged, impelled thereto, not by any selfish motive, nor by the hope of pecuniary reward, but actuated by feelings of the noblest philanthropy. It is a work in which the whole commonwealth is vitally interested, and this little city in which you are gathered certainly not less than any other community in the State, and its citizens are therefore glad to bid you God-speed in this whole work.

To me has been assigned the pleasant duty of bidding you welcome to Manhattan; and in behalf of the Mayor and Council of this city, and as well also of all the dwellers therein, I extend to you, as representatives from all parts of the State of the interest felt in, and the work being done for the promotion of health by the prevention of disease, a sincere, heartfelt greeting. A homely old adage says that “an ounce of prevention is worth a pound of cure.” Some of you in days gone by with skillful hands have administered to ailing mortals the “pound of cure.” Here and now with loving hearts you seek to induce others themselves to use the “ounce of prevention,” which if wisely used will render the pound of cure unnecessary.

Again I bid you welcome to our hearts and homes, with the confident belief that

your meeting will be a pleasant one for you and for us, and a profitable one not only to this community but to the whole State.

President Fairchild, of the State Agricultural College, one of the vice-presidents of the convention, responded to the address of welcome on behalf of the convention. He said there was thought in one consideration: Our gathering together is not for naught. We accept your invitation to your hearts and homes, with good-will. Your welfare and ours is the same. Health cannot exist soundly without soundness around it. The reason for the existence of this convention is, that society must protect itself against disease. The sound thought that moves the world to righteousness is found in the sounder bodies. This convention is engaged in building up society. We are not discouraged. The beginnings of things are important. We can be strong for all that is good. We have gone forward to some extent in sanitation. In spite of evils—corruption of all sorts—we live longer than our ancestors did. Let us be helpful one to another in this association. Again we thank you for this hearty welcome to Manhattan.

The first paper presented to the convention was as follows:

THE WATER-SUPPLY OF MANHATTAN.

BY GEORGE E. HOPPER, SUPERINTENDENT OF THE MANHATTAN CITY WATER WORKS.

Mr. President: The subject assigned me is, The Water-Supply of Manhattan. If I manage to answer the question, What is it? I hope you gentlemen of the convention will enlighten me a little by discussing what it ought to be.

The citizens of Manhattan use water from three sources, viz., cisterns, wells, and the public supply. Over half our residences are supplied with cisterns, almost all have wells. But thirty-four of the three hundred families within reach of the public supply use it for domestic purposes. None the less the character of that supply is of the utmost public importance, owing to the fact that it is the only water furnished our public schools.

The wells of the principal part of town reach through twenty-five feet of sand to the under-flow of the Kaw river valley, which is Kaw river water with the mud taken out. While varying somewhat, it contains on the average 57 gr. per gal. of mineral matter in solution, and an amount of organic matter varying with local conditions, yielding on analysis in some cases as high as .48 parts per million of alb. am., but usually less than one-fourth of that amount.

The wells of the college flat do not reach a water-bearing sand, but are wholly in clay, and depend for their supply on local surface drainage. They are therefore more liable to contamination from cesspools, etc., than the wells in the bottom.

Water supplied by the city plant is Blue river water, with the suspended matter removed. It is probably as good as any river water in the State, and carries ordinarily in solution 21.7 gr. per gal. of mineral matter, and .10 to .18 parts per million of alb. am., as well as a varying amount, often very large, of suspended particles, of which about $\frac{1}{2}$ in dried bulk is vegetable matter.

The river-bed opposite the pumping station consists of a layer of coarse sand eight feet thick, which is impregnated with river mud, a six- to twelve-inch layer of hard blue clay, a nine- to ten-foot layer of clean, coarse white and blue sand and flints, below which is a six-foot layer of hard blue clay, with nodules of disintegrating limestone. Water is taken from the bottom of the lower sand layer through twelve strainers. These strainers are six feet long and four inches in diameter, and

furnish easily 100 gallons of water per minute, each of which is the full capacity of our pumps. Analysis of a sample taken from these wells August 18th shows the presence of 21.27 gr. of solid matter per gal., and of .1068 parts per million of alb. am. This is probably the best water to be had in any considerable quantity in this vicinity. I do not hesitate to recommend it as a safe water for domestic use.

For fire protection, our public supply is all that could be desired, the elevation of our million-gallon reservoir giving a pressure at the fire-plugs of 87 pounds per square inch.

In a town with residences as scattered, and with good well-water as easy to get as we have it here, the only ground on which the building of a system of public water-supply can be justified is that it will be worth its cost for the fire protection afforded. Nevertheless, where such a system is built, the very best water obtainable should always be furnished, in order that the citizen may avail himself to the fullest possible extent of those conveniences which he *must* pay for whether he use them or not.

The paper was discussed by President Fairchild, Rev. D. C. Milner, Geo. E. Hopper, Esq., Prof. Failyer, and Prof. Hougham. Dr. Schenck was much pleased at the purity of the public water-supply of Manhattan, and emphasized his recommendation that families use it for all purposes, as it is safer than the well water. Dr. Roberts exhibited a section of the kind of strainer through which the water comes.

The next paper was presented by Dr. Redden, of Topeka, as follows:

THE SANITARY BUDGET AND HOUSEHOLD GEMS.

BY J. W. REDDEN, M.D., OF TOPEKA, SECRETARY OF THE STATE BOARD OF HEALTH.

It is a common expression, and professed to be believed by very many, that "there is nothing new under the sun;" and yet the scientific investigator and the ardent student are continually bringing to light and knowledge from the hidden mysteries of nature and the realms of science, discoveries and truths, both old and new, amid the admiration of the great thinkers, the approval of the countless multitudes, and for the benefit and happiness of the human race.

While the names of Harvey, Jenner, Gross and Simms are treasured in the hearts of the people of all countries, never to be forgotten, yet to-day the names of Pasteur of Paris, McKenzie of London, Koch of Berlin, and Rauch of our own country, are eulogized in all tongues, and their wisdom, their discoveries, and their humanitarianism are recorded in prose and sung in verse in all languages, amid the admiration of the scholar, the student, the philosopher, the business man, the mechanic, and the laborer. Hidden deep below the surface of the earth are found the rarest gems and the most precious metals, and yet it requires unceasing toil, application and patient research to discover and utilize them.

Likewise the scientific investigators in the realms of science, in microscopy, bacteriology, chemistry, sanitation and preventive medicine, are toiling, investigating and discovering at their firesides, in their laboratories by the midnight lamp, to establish and perfect those problems and discoveries that will send the rainbow of promise, the sunshine of hope and the assurance of happiness to the firesides and the hearthstones of countless thousands of homes that are now hidden in sorrow, and battling in uncertainty and despair with the great enemies of the human race. "The pestilence that walketh in darkness, and the plague that wasteth at noonday," all of which are slowly but surely yielding to the discoveries of the present age, and must soon be classed with the long list of other preventable diseases. Soon, hydrophobia, consumption, yellow fever, cholera, and kindred terrorizing fatal plagues, must

yield to the onward march of the discoveries brought to light by the honored medical giants who will put in perpetual motion the all-conquering king, preventive medicine. All hail the propitious day when his reign shall be established. How aptly did the great apostle to the Gentiles write: "For now we know in part." God has seemed to ordain that the hand of truth be placed in every department of life, that we may grasp it in the dark. Hidden truths are everywhere. Glorious truths sleep in every part of the universe. All our knowledge is but limited. Since the sixteenth century, money and time without limit have been expended in the investigation of the problems of Nature, and as yet a beginning has scarcely been made. Men have tried on the rock leaves to read the history of past ages, but in vain; all the earlier history is yet to be revised. Astronomy is no less imperfect, although the most ancient of sciences, and practiced by the Chaldeans on the plains of Babylonia, and by the Egyptian priests from the summits of the pyramids. Botany, chemistry and anatomy are equally imperfect. Janus-like, man looks both into the past and into the future; the natural eye gives him no insight into his past, for no speculation can afford even the dimmest hints of the genesis of life.

But the march of truth is certain; upward, onward, slow but sure will be her progress. The twentieth century will hail with wonder and amazement, but with gratitude and praise, the discoveries brought to light and the facts established by the great minds of the present generation in the realm of preventive medicine. As we open the sanitary budget to-night, I trust many household gems may sparkle with such attraction as to arrest your attention, and make such deep impressions upon your minds and consciences that they may act as beacon-lights along life's pathway, leading you to higher planes of usefulness and aiding you to become as ministering spirits in dispelling gloom, relieving distress and promoting happiness among neighbors and friends, and thus render life grander and humanity happier by your noble example. Let me, then, solicit your attention while I may briefly present to you these household gems.

DISSEMINATION OF SANITARY KNOWLEDGE.

The value of knowledge lies in its practical utilization. The value of any public good is greatest when distributed to the greatest number. To make sanitary knowledge available and productive of the greatest good, it must be generally disseminated throughout the country. The greatest obstacle in the way of health boards and other public health agencies is ignorance. People do not comprehend the importance of hygienic laws, and, through ignorance of these, fail to appreciate or regard the efforts of health officers. Orders or recommendations from health boards are disregarded because the people cannot comprehend their importance, and do not understand the ends to be attained. Sanitary science is comparatively new, and the prevention of disease as an actuality has not been impressed upon the public mind. There is a vast difference, in the popular comprehension, between the curing of disease and its prevention. The one is actual, visible, comprehensible presence; the other is vague, intangible, and not discernible by any of the senses. Man knows when he is sick; but he is unconscious of the approaching disease, because he is ignorant of the conditions that produce his maladies. He finds a remedy for the disease in the physician, but he seeks no remedy for threatened sickness, because he is not conscious of the approach of any ill. The question is, how shall people be taught the importance of preventive medicine to the same extent as that of therapeutics?

It is not possible to make of every person a doctor or a sanitary expert—such is not demanded; but it is possible to disseminate sanitary knowledge to such an extent that the people will ascribe as much importance to the prevention of the dis-

ease as they now do to its cure. An advance will be marked if the people can be taught that there is such a thing as the prevention of disease. If it were impossible to teach them the laws of hygiene and the practical application of the principles of sanitation, great progress would be made could they but be taught that through obedience to certain rules and regulations disease could be arrested. It is surely possible to extend knowledge thus far; and it is not impossible to extend it far enough to enable the people to understand the underlying—which are the simpler—principles of preventive medicine, and make a practical application of them. The problem lies in getting this information to the public. We are told that our public schools furnish this information. We know that some States require hygiene taught in the schools; but what is it that is taught? Anatomy, physiology, and a certain kind of hygiene. The text-books placed in our schools are not of the character to teach sanitary science as it is understood and practiced to-day. The pupil may learn to number the bones in the human body, and to name them, but is ignorant of the value of simple cleanliness. Besides this, such as is taught is taught to children too young to comprehend it, or even to think of applying it. It is true that the children of to-day become the heads of families in the future; but how much of this knowledge will they carry with them, and how much will they apply? It is not the children, but the heads of the families, that should be reached. The teaching of this subject in the schools is to be highly commended, but it is the home that must be awakened and inspired with the gospel of health. The home is the center of life that subdues the earth, and into it should pour the stream of knowledge, refreshing and health-giving as that of the smitten rock. Make healthy and happy homes, and the great object of sanitation will have been attained. These are the centers into which should be directed the knowledge gathered from the fields of research and the laboratories of experiment and investigation.

Let me impress the following facts, under the title of

MISSIONARIES WANTED.

In the life of every person opportunities occur now and then for acts which save human suffering, or possibly human lives. Thus you seize a friend by the shoulder and jerk him back from the carriage or car which threatens him. Why not likewise improve the opportunities, not so very infrequent, of saving a neighbor from the danger of disease which your better knowledge teaches you threatens him—a danger as real though not so visible as that of the approaching carriage? It is true that a person of any delicacy shrinks from acts which might be construed as officiousness, or from liberally endowing others with advice unasked. But cases occur quite often in which salutary advice or information may be imparted, and which will be received with gratitude. Only yesterday a letter came from a man of business, saying that typhoid fever had broken out in a small community using water from a source undoubtedly polluted, and requesting some of the typhoid-fever circulars for distribution. The person of intelligence who would not do as much under similar circumstances is almost comparable to him who would not stretch out his hand to pull a child from a pond when he can do it at no danger to himself. It is a duty which the educated classes owe to the individuals of that other large class which does not know or does not think, to shield them as far as possible from threatening dangers.

We would remind those persons who are not wholly wrapped in selfish interests, and who are willing to indulge now and then in a little moral diversion, that the State Board of Health publishes and at all times is glad to send circulars on various topics, which will help in giving useful advice in an impersonal way. Some of these circulars give information which is at all times worth having; some give instruction

which is invaluable in certain emergencies—epidemic or otherwise. Many persons need the information which these circulars give. Many suffer and cause others to suffer because they do not have it. We therefore invite our hearers to become missionaries in spirit, if not in name, and in answer to the question, "Am I my brother's keeper?" to be willing to acknowledge interdependence of interests, and to answer, "yea," and sometimes he is mine.

The Arkansas traveler's story about the leaky roof, which could not be repaired in the rain, and which did not need repairing when it was not raining, finds a parallel in those places where sanitation is disregarded. When sickness overtakes the people, they are unable to observe the laws of health, and when they are well they do not think it necessary. It is difficult, in some instances, to get people to observe sanitary regulations when no sickness is present, although the cause of the sickness may lie in the filth-pools about the house, be in the water they drink, or in the air they breathe. When they are taken sick they will take medicine, but when they are well they will not take precautions against disease; and so, through their physical leaky roofs, they get drenched unto sickness.

PREVENTION AND CURE.

The difference between the prevention of sickness and its cure as relating to the public, lies in the fact that people know when they are sick; but when well, they are seldom conscious of any liability to become ill. They have a direct conviction that something is wrong when they are visited by disease, but when they are in health they experience no impression that dangers are about them and preventive means are necessary. They are of those who "never miss the water 'till the well runs dry," but when thirsty, quickly seek relief. If people could by some means be convinced that they are liable to become sick as thoroughly as they are convinced when they are sick, sanitary science would have another meaning to them, and hygienic lives would become the rule instead of the exception. If the preservation of good health has not a money value, why is it profitable to pay doctor fees to be cured? For health is perpetual youth; it is to feel the body a luxury as every vigorous child feels, or as the bird when it shoots and quivers in the air, not flying for the sake of a goal, but for the sake of light, or as the dog when he rushes wildly across the meadows, or plunges into a blissful stream, but neither the child nor the dog enjoys his cup of physical bliss with a felicity half so cordial as the educated conscientiousness of knowing how to keep well, and to feel that you have turned that knowledge to good account, in preserving the health and saving the life of a fellow-being.

DO NOT "FEED A COLD AND STARVE A FEVER."

"Feed a cold and starve a fever," a maxim which has descended from a former time, when the opinions of physicians were very different from what they are now, like many other ancient errors, still clings to the present generation, and sometimes does harm. Instead of "feed a cold and starve a fever," intelligent persons now teach and practice just the reverse of this, viz.: Starve a cold and feed a fever. In the early stage of any febrile affection, no matter whether a common cold or a more serious trouble, it is better to withhold food a little while, or to diminish the customary diet, and this may sometimes prevent the cold from running into something more serious; but in a fever, after the first few days, the modern practice, and the best, is to feed the patient as abundantly with well-chosen, easily-digested food as the stomach will dispose of.

REFRESHING DRINK.

No one who, fatigued by over-exertions of the body and mind, has ever experienced the reviving influence of a tumbler of milk, heated as warm as it can be sipped, and with or without a teaspoonful of sugar, will willingly forego a resort to

it. The promptness with which its cordial influence is felt is indeed surprising. Some portion seems to be digested and appropriated almost immediately. And many who now fancy they need alcoholic stimulants when exhausted or fatigued will find in this simple draught an equivalent that will be abundantly satisfying and far more enduring in its effects.

THE DIET OF STRONG MEN.

The Roman soldiers, who built such wonderful roads, and carried a weight of armor and luggage that would crush the average farm hand, lived on coarse brown bread and sour wine. They were temperate in diet, and regular and constant in exercise. The Spanish peasant works every day and dances half the night, yet eats only his black bread, onion and watermelon. The Smyrna porter eats only a little fruit, and sometimes olives, yet he walks off with his load of a hundred pounds. The coolie, fed on rice, is more active, and can do more than the average negro fed on fat meats.

The following advice is valuable, and is given gratuitously upon the condition that you will practice it:

Great suppers will the stomach's peace impair.
Wouldst nightly rest? Curtail thine evening fare.
An empty stomach calling loudly for food,
To hear long tales is in no willing mood.
Eat not again till thou dost certain feel
Thy stomach's freed of all its previous meal;
This, mayst thou know from hunger's teasing call,
Or mouth that waters—surest sign of all.

Do not have too many pillows under your head when you sleep, for such a practice has a tendency to curve the spine, to cause droop-neck, and to interfere with the freedom of breathing, and the circulation of the blood.

At early dawn, when first from bed you rise,
Wash in cold water, both your hands and eyes;
With comb and brush then cleanse your teeth and hair,
And thus refreshed, your limbs outstretch with care:
Such things restore the weary, o'er-tasked brain,
And to all parts ensure a wholesome gain.
Fresh from the bath, get warm. Rest after food,
Or walk, as seems most suited to your mood.
But in whate'er engaged, or sport, or feat,
Cool not too soon the body when in heat.

PURE WATER.

One of the samples of water which came to the office a few days ago, was sent "because I keep summer boarders, and if the water is not good I do not wish to use it." If every keeper of summer boarders would be as mindful of the health of his guests as this man appears to be, the reputation of the State as a summer resort would be raised still higher. When outsiders come here for pure air and pure water, the best policy, financially and otherwise, is to give what they pay for. While this is true, we should never forget that intemperance drives reason out of the head, money from the pocket, the elbows through the sleeves, and health from the body.

I would also impress upon you the evil effects of

TOBACCO ON THE KIDNEYS.

Dr. Auld, an eminent physician of Glasgow, calls attention in a number of the London *Lancet*, to an important fact which seems to have heretofore been overlooked, viz., that tobacco may be a cause of organic disease of the kidneys. As it is well known, the appearance of albumen in the urine is the leading symptom of Bright's disease of the kidneys. Dr. Auld finds that the use of tobacco is often ac-

accompanied by this symptom, and lays it down as one of the results of chronic nicotine poisoning. According to his observations, tobacco is responsible for a very large number of functional disorders not commonly attributed to it. Tobacco poisons both the nerve centers and the nerve ends, causing muscular twitching and various other nervous symptoms. When these symptoms are present it is not sufficient merely to moderate the use of the drug, but it must wholly be discarded, otherwise a cure cannot be effected.

Is not the practice of kissing children when one has a sore throat a bad practice? A Dusseldorf physician says: "Speaking mildly, I would call this practice horrible, although the term 'murderous' was on my tongue. Yes, indeed, dear madam, 'murderous.' You will remember, perhaps, that fourteen days ago you, with a great shawl wrapped around your neck, made a visit to Mrs. S., and as the little Hans came running into the room, did you not snatch the little one in your arms, and, apparently overflowing with tenderness for him, kiss him to your heart's content? Then you began to relate what a horrible inflamed throat you had, so that the day before you had to decline an invitation to the concert. You had no designs on the life of that child, and yet you killed him just as surely as though instead of your tender kisses you had given him strychnine or arsenic. Your tenderness was fatal: two or three days later the boy began to complain of a sore throat, and when the physician came, one word, 'diphtheria,' made all clear. To-day a little freshly-decorated mound in the churchyard is the only reminder of your visit. The mother has, of course, not the slightest suspicion of you; she ascribes her bitter loss to Providence. The physician did nothing to disturb this belief, for this would have been as unwise as unkind; but I will say it, that to your folly alone, my dear madam, the death of little Hans is due."

The members of the same family are often divided in their sentiments and opinions. The following colloquy is an apt illustration: "Who is your family physician, Freddy?" asked Mrs. Hendricks of the Brown boy. "Pa's a homeopath, Ma's an allopath, sister Jane is a Christian scientist, Grandma and Grandpa buy all the patents going, Uncle James believes in massage, and brother Bill is a horse doctor." This conversation may illustrate the statement, "Where ignorance is bliss, 't is folly to be wise."

First Apprentice: "What kind of plumbing is that, with the soil-pipe comin' down on the outside of the house by them winders there?"

Second Apprentice: That's no soil-pipe, yon idiot; that's a fire escape."

First Apprentice: "Fire nothin'. Suppose a combustion was to break out in that top story; how on earth could the fire escape down those iron rods, without so much even as a straw to cling to?"

Many of you may have had expensive experience with plumbers and gas men; if so, the following may confirm your opinions of them:

BALANCING ACCOUNTS.

A gas man and a plumber
Had a settlement to make,
And each bethought him happy,
On raising quite a stake.

But when they went to settle,
And each unrolled his bill,
The grand array of figures
Made each one's heart stand still.

The gas man viewed the plumber,
And the plumber him a bit;
Then said the gas man, slowly,
"Let's just swap bills and quit."

Now let me call your attention to some important facts in reference to the necessity of pure air, ventilation, and out-of-door exercise. We have heard much said about the injurious effects of breathing the midnight air. This brings to mind the many admonitions heard regarding "staying out in the night air," "breathing the night air," etc. Probably ninety-nine persons out of every hundred have been cautioned against breathing night air. Well, what is to be done? We have to breathe, and if we do not breathe night air, what on earth will we breathe during the night? The trouble is we do not breathe enough night air. In cold weather, especially, we shut up our rooms and breathe the air therein over and over again, when we should be breathing good, pure, fresh night air. There is a story told of an elderly lady who ruined her bread with salt by not putting any in it. So do we injure ourselves with night air by not breathing enough of it. If the air about a habitation is bad at night, there are not wanting reasons for suspecting it in the daytime. By all means take as much exercise as you can, and be in the open air as much as possible. Outdoor life is the natural condition of mankind, and the more one can have of it, the better. The practice must not be carried to extremes, however. There are many days when one is much better off in a warm, comfortable and well ventilated house, than trying to take outdoor exercise in a midwinter storm or under a July sun; and no one ever strengthened his constitution by sleeping with his bed-room window open with an outside temperature at zero, or allowing the snow to drift upon his pillow. Fresh air, sunlight, good and sufficient food, pure water, outdoor exercise, temperance in all things, and a cheerful disposition, are the chief remedies in Nature's pharmacopœia, and are worth more than all the drugs and medicines of the shops. Dr. Holmes has truly said that if nine tenths of the medicines in the world were poured into the ocean, it would be all the better for mankind, and all the worse for the fishes; and the best physicians can do little more than to provide good nursing and aid nature in throwing off disease.

INVEST IN THE FRESH-AIR FUND.

At this season of the year the man of business, who prides himself upon his prudent management of all his affairs, who protects himself against overwhelming loss by fire insurance, and who by life insurance protects his family against some of the hardships which might be theirs in case of his untimely death, goes and starts up the furnace in his home, knowing that it is furnished with no fresh-air inlet, and that it is to supply cellar-air for breathing purposes to himself and family for the livelong winter. He has fortified himself at every point, of which he can think, against loss and sorrow, and yet has left the large gap open through which the enemy most frequently approaches. This is one of the inconsistencies of which, in some form or other, all human nature is guilty now and then.

No matter how Nature has endowed him, man's judgment is sound on those subjects with which he has familiarized himself, and hygiene is one of those matters which neither the preparatory schools nor the larger school of life has taught in a living or applied form to our average man. He has perhaps heard of the farmer who carried a pig in a bag, and when he got home, still had the pig, but not a living one. He had probably read also of the Black Hole of Calcutta, and the swift destruction of the unhappy prisoners with re-breathed air; and he has perhaps read too of the marked diminution in the loss of horses from disease in the English cavalry after better ventilation was provided for the stables; and of the greatly lessened death-rate in certain orphans' homes after ventilation was secured; and that the breathing of impure air has a debilitating influence upon the general health, and predisposes to attacks of serious and dangerous disease. He has even given something to the fresh-air fund, which beneficently carries the poor, sick city children

into the country for a few weeks; and yet he wonders why it is, his own children, every year before spring has come, are so run down that the all-summer's outing is an absolute necessity for them.

Cellar air is bad, and not fit for breathing, no matter how clean the cellar is or what care has been taken in cementing it. Cellar air, especially when the suctional power of the furnace is exerted on the cellar, is largely ground air—is drawn from the soil beneath and surrounding the cellar—and the air from the ground is very different from the air above the surface. Money expended for supplies of air from pure sources is money put into one of the best forms of insurance.

COLD SCHOOL-ROOM FLOORS.

See that the floors of country school-houses are made as warm as possible for the winter terms. Persons who are now reckoned as children of a larger growth have told me how they had to sit for hours at a time when they were children, with their feet curled up on the seat under them to keep them from freezing. There are just such school-houses in the country now; the floors of which could be made warm at a very little expense; and we wish we could induce the school officers whose privilege and duty it is to look after these school-houses, to consider themselves, one and all active members of the Society for the Prevention of Cruelty to Children. It is not only cruel, but it is dangerous to the life and health of these children to let them suffer thus.

VENTILATION.

An old writer says: "When men lived in houses of reeds, they had constitutions of oak; when they live in houses of oak, they have constitutions of reeds."

This is a very picturesque description of the injury which may come to us from fine houses too closely sealed to keep out the fresh air, and too heavily curtained, preventing the entrance of sunshine, which is almost or quite as important as air. But it is not at all necessary to have our fine houses unhealthful, and it requires intelligence and thoughtfulness to render a house of oak as promotent of health as a cabin. Fresh air will come into a well-ventilated oaken house, as well as through the open cracks in a house of reeds, and sunlight through a window in a palace as well as a hovel.

VENTILATION FROM NECESSITY.

"Brethren and sisters," and the patient old pastor buttoned his threadbare coat closer about his spare form. "I notice that some members of the congregation are shivering from the cold. I should have replaced the broken pane of glass in the window behind me weeks ago with rags, if they could have been spared from the family wardrobe. The collection for foreign missions will now be taken up."

OPEN AIR.

An unknown poet has left the following very sensible health code:

"Take the open air—
The more you take the better.
Follow Nature's laws
To the very letter.
Let the doctors go
To the Bay of Biscay;
Let alone the gin,
The brandy and the whisky.
Freely exercise,
Keep your spirits cheerful;
Let no dread of sickness
Make you ever fearful;
Eat the simplest food,
Drink the pure cold water—
Then you will be well,
Or at least you oughter."

PHYSIOLOGY AND HYGIENE.

The study of physiology and hygiene is making itself felt in the land. In his composition, one boy writes, "Girls kill the breath with corsets that squeeze the diaphragm. Girls can't run or holler like boys, because their diaphragm is squeezed too much."

SUNSHINE.

Again, do we fully appreciate the value of sunshine? Sleepless people—and there are many such—should court the sun. The very worst specific is laudanum; the very best is sunshine. Therefore, it is very plain that poor sleepers should pass as many hours of the day in sunshine, and as few in the shade, as possible. Many women are martyrs, and they do not know it. They shut the sunshine out of their houses and their hearts; they wear veils; they carry parasols; and they do all that is possible to keep off the subtlest, and yet most potent influence which is intended to give them strength, and beauty, and cheerfulness. Is it not time to change all this, to get all the roses and color in the pale cheeks, strength in the weak souls? Too many are pale and delicate. They may be blooming and strong, and the sunlight may be a potent influence in this transformation.

A FEW WORDS FOR THE LADIES.

The following receipt is gratuitous, and if practiced will not only be beneficial, but also save much time and money:

A RECEIPT FOR THE COMPLEXION.—Ninon de Lenclos, who even in advanced age was renowned for the beauty of her complexion, and who was envied by all the younger ladies of her time, was asked by one of them one day to tell her what means she used to preserve the health and beauty of the skin, and she showed:

A wash bowl,
A water pitcher, and
A piece of flannel.

There is a custom that is very prevalent; confined to no sex, age, condition, nationality, class, or station. It bids defiance to time, weather, and circumstances. It is familiarly called

CHEWING GUM.

As very little is ever said in its favor, I will give you the following for what it is worth: There is something peculiar and unique in the sensation produced by chewing gum. In chewing anything else, unless it is "sin as a sweet morsel under the tongue," the bulk is reduced and one feels as if he were making some headway; but not so in chewing gum; the more you chew it the better, if not the larger, it gets. And herein lies one of the benefits of this practice. It is a recreation—like picnicking and chasing the butterfly. One is led on and on, forgetting the cares and trials of life, and with stimulated hopes and ambitions that, if not realized, leave the seeker, because of the exercise, better and braver.

Another important advantage derived from its use is the fact, while being practiced, no one becomes angry, the most irritable in temperament are angelic in disposition, and unkind and hurtful words that might have been indulged in without its use, are unsaid.

We believe that every ship sailing upon the high seas should be well supplied with chewing gum, and in the time of danger of shipwreck the passengers should be furnished with at least a half-dozen pieces, so that if cast upon some barren and uninhabitable coast or island they might have something with which to beguile the weary hours; and we know of nothing so innocently beguiling. The lover and the lass, or even those who are older grown, are never so well prepared to speak those words

that are destined to unify and harmonize their destinies as when each is under the enchanting spell of a well-regulated piece of chewing gum.

Let me speak briefly of the

MISSION OF PAIN.

None relish pain. It is not considered one of heaven's good creatures. Its possessor is pitied, not envied, and one who inflicts pain is an object of censure, if not punishment. Yet, pain is an evangel of protection and mercy. Paradoxical as it may seem, the mission of pain is to prevent suffering; it is a faithful, ever-watchful sentinel, guarding the citadel of the house in which we live, and warning us of even the invisible attacks of microscopic foes that float in the water and lurk in every passing breeze.

An anonymous writer in *Temple Bar*, some years ago, said most beautifully:

"The power which rules the universe—this great, tender power—uses pain as a signal of danger. Just, generous, beautiful Nature never strikes a foul blow—never at us behind our backs; never digs pit-falls, nor lays ambuscades; never wears a smile upon her face when there is vengeance in her heart. Patiently she teaches us her laws, tenderly she graduates their force. Long before the fierce danger-light of pain is flashed she pleads with us, as though for her own good's sake, not ours, to be merciful to ourselves, and to teach each other. She makes the over-worked brain to wander from the subject of its labors; she turns the over-indulged body against the delights of yesterday. These are her caution signals: "Go slow." She stands in the filthy courts and alleys that we pass daily, and beckons us to enter, and realize with our senses what we allow to exist in the midst of the culture of which we brag. And what do we do for ourselves? We apply whip and spur on the jaded brain, as though it were a jibbing horse, force it back to the road that leads to madness, and go on full gallop. We drug the rebellious body with stimulants. We hide the signal, and think we have escaped the danger, and are very festive before night. . . . At last, having broken Nature's laws and disregarded her warnings, forth she comes—drums beating, colors flying—right in front to push us. Then we go down on our knees and whimper about its having pleased God Almighty to send this affliction upon us, and we pray him to work a miracle in order to reverse the natural consequences of our disobedience, or save us the trouble of doing our duty."

The following should receive your approval and indorsement:

HOW TO BE HAPPY UNDER ALL CIRCUMSTANCES.

I must introduce myself, that you may know on what authority I am speaking. I am young in years, but I am a veteran in the noble army of martyrs who have had to fight aches and pains almost from the cradle. Both my parents died with consumption, and I think I was born with nervous prostration. At the age of five, I could read or write in my own language—the Russian; at nine, studied Latin; at ten, Greek and German; later on, even Hebrew was added to the dead languages. At fourteen, I began to practice the violin, and at fifteen my nervous system gave out, and I had to leave college. At eighteen, during my final examination, I was arrested on suspicion of being a nihilist, and soon after I had to leave Russia, to be saved from spending the rest of my days on the sunny plains of Siberia. On my arrival in this country I concluded to go on a farm, so as to give my brain a rest and develop my body; but not being used to any manual labor whatever, the hard work of the farm with want of good food, soon exhausted the little strength I had, and this time my sickness took on the form of lung trouble. The best physicians in New York city gave me up to die of consumption; but I went to California, spending two years there in the open air, under the care of a strictly hygienic physician. I disappointed the predictions of the scientific gentlemen, and I did not die, and I am not dead yet. Last winter I went to New York to complete my medical studies, and working there very unwisely, my nervous system gave out again. Though I had been here two years, before going to college, yet I did not learn the important lesson of resting, and only doing what I could; so that when the winter course was ended, I was about ended too. I went all to pieces; I was in bed for several weeks, without being able to raise my head. If I were to tell you the disappointment I had last winter, and what I suffered during my last struggle for health, I know you would grant me the privilege of calling myself the most miserable man in existence; and yet if anyone should tell me so, I should show a disposition to fight, because I consider myself one of the happiest of men living. What, then, is the reason, that notwithstanding all my sufferings and disappointment, I consider myself so happy? It is because in the first place, I have learned the important lesson to think of others. I sometimes remark that I have a personal acquaintance with all classes of people, from the American tramp to the American millionaire, and I have yet to find a case where a man having all the wealth he wants, the best of social conditions, and even the greatest boon he can possess, good health, who is happy, if all his thoughts and aspirations are centered in self.

I would urge every one to adopt as his motto, and practice daily—

THE TEN (SANITARY) COMMANDMENTS.

I am Hygeia, the daughter of Esculapius, the Giver of Health; and the one who savest thee from the bondage of Pain.

1. Thou shalt not esteem Money, or Land, or Fame, or Learning, as idols before me.
2. Thou shalt not make unto thee any adulterated likeness of anything that is in the Heaven above, or that is in the earth beneath, or that is in the water under the earth. Thou shalt not possess them, for I, Hygeia, am a just goddess, visiting the disobedience of these, and all my laws by the fathers, even upon the children of the third and fourth generation of them that despise me, and showing mercy and giving health unto thousands of them that love and keep my commandments.
3. Thou shalt not speak lightly of me, nor take my name in vain; for though I am thy preserver, I will not hold him guiltless that despiseth me.
4. Remember thy body to keep it clean, for cleanliness is next to godliness. As sayeth Emerson, "It is better to eat with a washed sinner, than with a dirty saint." Six days shalt thou labor and be industrious, but the seventh thou shalt observe as a day of rest. In it thou shalt be especially clean, and shalt not do any unnecessary work, thou, nor thy son, nor thy daughter, nor thy man servant, nor thy maid servant, nor thy cattle, nor thy stranger that is within thy gates.
5. Honor me and reverence my statutes, that thy days may be long and happy upon the land on which thou dwellest.
6. Thou shalt not kill, unless it be disease germs (which my soul hateth), and those who obstruct and disobey the laws of quarantine which I have proclaimed for the protection of my followers.
7. Look not thou upon the wine when it is red, for wine is a mocker. It tendeth to poverty, adultery, and death. At the last it biteth like a serpent and stingeth like an adder.
8. Thou shalt not steal any pestilence nor contagion from thy neighbor, nor shalt thou give them unto another.
9. Thou shalt not bear false witness against thy neighbor, nor against Providence, by accusing them of causing thy sickness, when thou, thyself, art daily transgressing my precepts and inviting upon thee my sure and just penalties.
10. Thou shalt not covet anything that thy neighbor hath,—his house, his wife, his man servant, his maid servant, his ox, nor his ass, nor *any* thing,—so much as the good health and happiness that I will give thee if thou wilt faithfully obey my laws and humbly and continually walk therein.

I would urge every person to adopt and practice the following:

THE SANITARY ALPHABET.

As soon as you are up, shake blankets and sheet;
 Better be without shoes than sit with wet feet;
 Children, if healthy, are active, not still;
 Damp beds and damp clothes will both make you ill;
 Eat slowly, and always chew your food well;
 Freshen the air in the house where you dwell;
 Garments must never be made to be tight;
 Homes will be healthy if airy and light.
 If you wish to be well—as you do, I've no doubt—
 Just open the windows before you go out;
 Keep your rooms always tidy and clean,
 Let dust on your furniture never be seen;
 Much illness is caused by the want of pure air,
 Now to open your windows be ever your care;
 Old rags and old rubbish should never be kept;
 People should see that their floors are well swept;
 Quick movements in children are healthy and right;
 Remember the young cannot thrive without light;
 See that the cistern is full to the brim;
 Take care that your dress is all tidy and trim;
 Use your nose to find out if there be a bad drain,
 Very sad are the fevers that come in its train;
 Walk as much as you can without feeling fatigue;
 Xerxes could walk full many a league.
 Your health is your wealth, which your wisdom must keep;
 Zeal will help a good cause, and the good you will reap.

I will now close with the following extract from a remarkable address, delivered

by a colored orator before an immense audience. It is worthy of careful consideration:

"MY DEAR FRENS: I ar' happy to be wid you dis evenin'. As you hev doubtless bin informed, I shall speak to you on de subjick of health. What is health? I answer dat it is natur' in her simplest form. Man is supposed to be created in a perfectly healthy state. He is a finished piece of mechanism. All de wheels an' levers an' springs an' gearin' ar' in place, an' all run smoothly. Now, what stops de masheen? Man's own ignerence an' keerlessness. Elder Toots, fur instance, has a baby at his house—a lump o' charcoal 'bout a y'ar ole. Dat baby was bo'n in de best of health, an' natur' would keep him dat way if she war' allowed to. But, she hain't allowed. Mrs. Toots goes an' puts clothes on it, an' she feeds it sweetened milk, an' doses it wid paregoric, an' weakens its spine by drawin' it in a baby kerridge, an' it is tumbled into a feather bed o' nights to roast between two grown people. Dat masheen is outer order afore it is a y'ar ole. Den de ole woman she recommends sassy-parilla, and de ole man he recommends burdock, an' all de women come in an' recommend dis, dat an' de odder, an' if de baby libs frew it luck is wid him.

"My frens, de aiverage man comes mighty nigh being an' idiot in takin' ear' of hisself. You hev seen him wearin' a fur cap on his head, while his shoes let in de snow and water. He wears an obercoat on his back an' nuffin' but a thin shirt over his chist. He's mighty skeert about freezin' his fingers, while his throat is exposed to blizzards. An' he's aillin'—aillin'—or he thinks he is. It's herb teas, root tonics, pills, plasters, an' cures, until de balance wheel in his machinery comes to a dead stop. Natur' wants to keep goin' but she can't. He drinks whisky, and that clogs de valves. He drinks beer, an' dat clogs de wheels. He pours down lemonade, ginger-ale, buttermilk, ice-water, tea, coffee, an' what not, an' den wonders why de fires under his biler won't burn. If you should take an ox an' put him through a like performance, he'd be dead in a y'ar.

"De simplest an' plainest laws of health ar' outraged ebery hour in de day by de aiverage man. Did Adam smoke? Did Eve wear corsets? Did Solomon chaw terbacker? Did Ruth chaw gum? Did de chillen of Israel make for a beer saloon after crossing de Red Sea? Did Rebecca eat gum-drops an' ice cream an' call for soda water? Adam was de fust man, an' made perfect from head to heel. How long would he hev remained so arter eatin' half a mince pie before goin' to bed? Suppose he had slept in a bed-room 6x8, wid de window down, de doar shet, an' two dogs under de bed? Supposing Eve had laced herself up in a corset, put on tight shoes, sot up all hours of de night eaten' her fill of trash, and sizzled her ha'r? When you cum to look into de way man misbehaves hisself you can only wonder how he eber libed to get dar.

"De man who wants to lib to a good old aige en' keep shet of de doctors, has got to obsarve sartin principles. No dead cats must be 'lowed to remain under de house above a week. He may love his dog, but de dog should be giben de parlor bed-room if he must sleep in de house. Bones, fish-heads, hens' feathers, ole rags an' rats should be cleared away from de back doah at least twice a year. He must wash his feet now an' den, eben if it is a little trouble. Good, plain water is what his system wants, an' anything else is an injoory. Let de air into your sleeping-rooms, eben if you ar' behind on your rent an' expect a visit from de landlord. Adam had only fruit an' vegetables to eat, but so fur as I kin discover, chicken pot-pie isn't onhealthy. Warm biscuit an' honey may not do any pertickler good, but dey seldom kill. Roast beef an' baked 'taters may or may not cause a flutterin' of de heart, but I allus risk it. I reckon Java collee acts to thicken de blood, but it can be drank in moderation. Watermillyons—

"My frens, my time is up. Dis has been a glorious oecasion to me. Thankin' you fur your kind attenshun, I will now bid you good-night."

The character of this paper obviated any discussion. The last paper of the evening session was as follows:

LIGHT IN THE SCHOOL-ROOM.

BY PROF. J. D. WALTERS, OF THE STATE AGRICULTURAL COLLEGE, MANHATTAN.

That our present methods of school instruction are productive of many ills of the flesh cannot be denied, but no part or organ of the tender body of the child is sinned against more than the eye.

Statistics from Germann cities, where careful investigations with regard to the effect of school-work upon the eye were made for nearly two generations, show that at the age of twenty nearly 30 per cent. of all the youth is suffering from some defect or disease of this organ. In many cases a predisposition to some malformation or disease was found to be hereditary with the family. In other cases, the defect was evidently the result of early and intensive work in some industrial establishment

or carelessness on the part of the early nurses. General weakness of the system, the result of an endless series of causes, seemed also frequently to be accompanied with impaired sight. A few cases were the immediate results of accidents, especially of explosions. In most instances the defect was not of a serious nature, and quite often the pupils and their parents were not even aware of it, as it was simply a partial color-blindness, or, perhaps, an inconsiderable change in the curvature of the eyeball causing a slight development of myopia or hypermetropia. In nearly one fourth of all cases, however, the malformations or diseases were found to be pronounced enough to seriously endanger the future use of the precious organ, and seemed often to be directly traceable to overwork in reading, writing, drawing, and needle work, especially when done in poorly-lighted school-rooms, or home studies.

Dr. Cohn, of Leipzig, one of the foremost authorities on this subject, in his work, "Untersuchungen der Augen von zehntausend und sechzig Schulkindern," asserts that in an examination of 10,060 pupils of common schools in his country he could clearly trace the increase in the proportion of myopia according to the construction of the desks and the lighting of the school-rooms.

Dr. Meppen, another authority, says: "Myopia is liable to be contracted by children of families where a near-sighted member was previously not known. It may be the result of —

"1. A prolonged and steady looking at an object or objects near the eye, though at proper distance, without rest or frequent change of the visual focus, as in long and absorbed novel-reading, intense study, or persistent diligence in needle-work.

"2. The practice of reading or otherwise using the sight at too short range, which results in part from insufficient light, or from its faulty direction, so that direct rays fall upon the eye, causing undue contraction of the pupil, while the page is in shadow.

"3. A prone or forward position of the head too long maintained, or frequently repeated and becoming a habit. This results from reading or studying with the book on the lap, and from the use of desks not graded to the height of the student."

Similar testimony comes from Prof. J. Solberg, F.R.C.S., of London, whose works on the diseases of the eye are considered as standard on both sides of the Atlantic. The Professor says: "There can be no doubt that the degree of myopia is often greatly increased during childhood by long-continued study, more especially by insufficient illumination and a faulty construction of the tables or desks at which the pupils read and write."

Dr. Risley, who at the instigation of the board of education of Philadelphia made a very thorough investigation into the condition of the eyes of the public-school children of that city, holds that the excellent system of education maintained there is not responsible to a great extent for the defective eye-sight of the pupils, but admits that myopia, commencing in the primary classes with a low percentage, steadily increases as the pupils pass to a higher grade in the public schools.

Statements of this kind from the highest professional authority in America and Europe, could be cited almost *ad infinitum*, but I will assume that the case is established, and proceed with the discussion of preventives, as far as they pertain to the construction of the class-room and the arrangement of the furniture, *i. e.*, to the architectural side of the question. I wish to say, however, that I have selected this subject, not because it appears to me the chief source of danger, but simply because of the chance which I have had for over a dozen years to make observations and experiments in this direction. The poorly-built class-room and its poorly-constructed furniture, are simply one, and not the main one of the many causes of myopia and other malformations and diseases of the eye. My experience is that the early and excessive night-work of the pupil, extracted from him by insufficient

and poorly shaded petroleum lamps and flickering gas flames, is far more pernicious.

An examination of a large number of school and college buildings in the Western States and in central Europe, as well as a diligent consultation of architectural literature, has convinced me that clear-cut principles pertaining to the art of lighting school-rooms and slöjd shops, are entirely wanting. Little as may be known about ventilation or acoustics, the subject of illumination is still more in the dark so to speak. All educators and architects agree, of course, that a school-room should be well lighted, and that the pupils should not face any windows, if possible; but they disagree on almost every other point. Looking over a recent volume of the builders' edition of the *Scientific American*, one of the best known American magazines, I found on two consecutive pages the following statements, which may serve as an illustration of the confused opinions held with regard to this important matter:

Says Professor Search, superintendent of public schools at Sidney, Ohio:

"When the lighting of a school-room must be from two sides, these sides should be left and rear but never left and right. In the reports on this subject of the schools of an adjoining State, 97 per cent. of the school-rooms receive light from both right and left—and many from the rear also, and nearly 10 per cent. from the front. It is apparent that the many angles of light thus given must cause the most deleterious effect on the eyes of the pupils. I prefer an unilateral light from windows very large, or so arranged in groups as to give admittance to a few broad bands of light, rather than too many streams of light from numerous small openings."

On the very next page is given a novel plan for a four-room village school-house, by Mr. F. Langdon, of Winona, Minn., who claims that his design is not a mere experiment, but is the outgrowth of forty years of careful study, aided by the suggestions of some of the best educators in the land. In the description of this building, Mr. Langdon says:

"The injurious system of admitting light from only one side of the room is completely obviated by this plan. The light is here admitted just as it should be—from rows of windows arranged on either side and from behind."

A comparison of these statements will show that they are in many respects the very opposite of each other. One writer complains that so many school-rooms are lighted from both sides, and would admit the light from the left and rear in a few broad bands; while the other considers the system of admitting light in this manner as injurious, and advocates the placing of rows of windows on both sides and behind. Which method is the better? Are they both right, or are they both wrong? Evidently a question about which opinions differ to such an extent is far from being settled, and it cannot hurt to make some more experiments and to keep up the discussion. My ideal of a properly-lighted school- or slöjd room conforms with the following maxims and features:

1. The school-room should be lighted from one side and from the top. The side light should come from an amply large group of windows to the left of the pupils, well forward, and reaching from the ceiling to within the usual distance from the floor.

2. No direct sunlight should strike this group of windows; therefore, the pupils should face east, so as to place the side light to the north.

3. All glass should have a slightly corrugated surface, so as to diffuse the light better, and should contain a milky-white coloring matter. Semi-transparent curtains of gray, light-blue or pale-green fabrics would be sufficient to protect the eyes from too strong a side light, and shutters would be unnecessary.

4. The ceiling windows should be arranged in a continuous band on the north, west, and south, similar to the roof-lights of a passenger car, only much larger; but no direct sunlight should be permitted to strike any of these—an arrangement that

could easily be made by letting the upper part of the roof project a short distance beyond the sashes. No highly-colored glass should be used.

A good way to obtain this much-needed top-light, and one that could be adopted with little expense in altering the present school buildings, would be to admit it into the unused attic by means of numerous ordinary dormer windows placed on all four sides of the roof, and thence through the ceiling into the class room or rooms by means of a very large horizontal window of corrugated "milk-glass." It would be an easy matter to make such an horizontal window ornamental by giving it the form of an Italian or gothic rosette window. Only a very large window, however, would answer the purpose.

5. The interior decoration, which has also a great deal to do with the question of light, should be in some very light and non-reflecting tint of blue, green, or gray; while the blackboards should be dark-gray or dark-green. Small quantities of high colors might be used in the designs of the decoration without fear of bad results, but metal lusters should be avoided even here.

6. The school-room should be large and high, so as to make it unnecessary to place pupils close to the windows or walls—positions where the light is always unevenly distributed. No system of lighting can give entire satisfaction where the room is overcrowded.

7. The furniture should be finished without varnish or heavy polish. A so-called oil-finish is preferable for a number of reasons.

8. In the manufacture of pupils' seats and desks, there has been such a wonderful advance made during the last twenty five years, that little seems to be left for criticism. All the school furniture of the West is made in a few large establishments, where it was comparatively easy to effect any desired reform. In this respect we are undoubtedly ahead of every other nation.

9. It will be evident that college-rooms, where special work in dissection, mycology or slöjd is carried on, require certain changes in the architectural features. But even here the principles should be followed: (1) to shut out all direct sunlight; (2) to let in enough diffused top-light to obviate all strong shadows, and (3) to have plenty of light. I readily admit that such a school-building, if built carefully and on a large scale, would be expensive, and would give a rather odd-looking piece of architecture. It would lack the familiar geometrical repetition of the narrow slit window. It could not be many stories and imposing, on account of its light; would present but little chance for a display of the conventional decorations, which we are wont to stick indiscriminately on our public and private buildings of every kind. Yet, the public eye would soon become accustomed to the new form as it became to the modern railroad depot, the glass-roofed studio of the artist, the windowless library, the octagonal cyclorama, the locomotive-shed, and the water-tower. Gradually it would discover beauty, where at first it saw but oddity—it would behold the beauty of the fitness of things, of necessities well met—and the æsthetic world would be richer by an original form. A beginning made, the old educational mixtum composition, with Greek cornices and gothic sleepers, would soon vanish, and there would be less inflamed eyes, fewer goggles, monocles and binocles. It is safe to predict that the school house of the future will have an architectural character of its own.

The above paper was discussed as follows:

Geo. E. Hopper believed the defective vision of many of the students of the Agricultural College was due to the miserably poor, small kerosene lamps used so extensively in getting their home lessons, and thought that in some cases the injury received was not nearly offset by the advantage gained by the education.

Prof. Hougham, using his own case as an illustration, did not think a poor light was wholly the cause of defective eye-sight. In a college course of six years, he had used a tallow-dip, and on account of its dimness, had to have it immediately in front of him, where it could shine in his eyes.

This led President Fairchild to remark that the eye-sight of students was, no doubt, often injured by the heating of the forehead by kerosene lamps, when they are in front of the head.

Professor Kellerman said he was satisfied that the use of a microscope was not injurious to the eyes. It would only fatigue the eye already injured.

Professor Walters, in answer to a question, said the hardest alphabet on the eye was the English, and the easiest was the German; but, for the convenience in making English letters darker, so as to be used in various ways, it would probably be the universal letter by the close of the present century. He said that the number of those who have disease of the eye is not greater than those who have disease of the stomach.

Doctor Schenck said an exhausted nervous system had its serious effects on the eye. Good care of the whole body is the protection for the eye.

Other remarks were made by Professor Kellerman and Judge Spilman.

The convention then adjourned until the next morning.

SECOND SESSION.

MANHATTAN, December 5, 1890—9 A. M.

The convention was called to order by Dr. H. S. Roberts, one of the vice-presidents.

The following paper was not ready to be read at the convention, but has since been furnished by its author for publication:

THE POPULAR DEMAND FOR INFANT-FEEDING.

BY J. W. JENNEY, M. D., OF SALINA, MEMBER BOARD OF HEALTH.

For a number of years before his death, the Hon. Thad. Stevens, of Pennsylvania, was known in the National House of Representatives of this country as the great objector. He was ready, in fact, at any time to object to what he considered to be an extravagant use of public money, and, in fact, it would appear that he was an objector to appropriations of all characters upon general principles. Mr. Stevens was not without his use, however, for in objecting to these appropriations he frequently sounded the alarm and warned the country of some intended and extravagant raid upon the public treasury.

In the scientific world there are those who might appropriately be termed protestants—they say to themselves “I protest,” and sometimes in their zeal say it loud enough to be heard. When “I protest” is said loud enough to be heard, the protestant is subjected immediately to a storm of scientific ridicule, and the attempt is made to have him publicly pilloried in the market place, or in some other place where the public at large can witness the operation. Among negative or neutral characters, these days, there is often heard a long-drawn sigh, accompanied by a

phrase like this, "Well, this is a scientific age, and really I don't know where this thing is going to end." The word thing is applied, or intended to be applied, to scientific advancement, or so-called scientific progress. From a common-sense standpoint there are certain things connected with sanitary science, nowadays, against which I almost venture to say, loud enough to be heard, "I protest."

I protest against the demand made upon mothers by society of this day, to surrender up their babes to certain forms of scientific feeding, simply that they may be victims to science. When one looks over the long list of so-called scientific preparations which are advertised and recommended as infant foods, the wonder is that one baby out of ten should live through its first dentition without falling a victim to scientific or artificial feeding. It would be irrelevant to our purpose here to enumerate the long list of preparations known and sold as infant foods, and the mechanical contrivances through which the infant is to practice feeding. Their name is almost legion, and a certain per cent. of the druggists' stock nowadays is made up of these articles in popular demand. Let us ask, in the first place, what makes it, or seems to make it, necessary for scientific sanitarians and philanthropists to exercise their inventive genius in order to bring their contrivances to the notice of tender parents? In answer to this, we may notice two factors:

First, the mother must be relieved as early as possible from the burden as well as the disgrace of nursing her own infant. Society makes demands upon her time, and besides, it adds much more to her good appearance to have her breast padded with cotton batting, according to taste, than to display a well-developed pair of natural breasts. Cotton batting can be adjusted to suit the length and circumference of the individual, while the natural breast-works may be deficient in contour and tasteful equipment.

Second, the anxiety pervading the breasts of many scientific men to become philanthropists and benefactors of their race. They, however, always have an eye single to the ducats to be derived from the traffic in their inventions.

Taking these two factors together, they resolve themselves into a moral question, and operate morally upon society. But this is the day of sociological tyranny, and society must pay the penalty. This would be all right were the penalty inflicted upon the adult portion of society; but it falls upon the "mewling and puking" little infants, who are all the time unconscious of the sacrifices they are making for the good of society and the advancement of science. They are the physiological laws of development, then, which should be the more earnestly studied, rather than the artificial methods of development. It is a well understood and admitted fact, that the mother's milk affords the best nourishment for the infant. The preparation for the infant should be made for it before it is born. For this the woman should be prepared and developed, if possible, to become a mother. If there is anything with which the honest and conscientious physician should find fault, it is with our artificial system of female education. It might be called a sensational and sentimental system of education. It is called humanitarian, but it is more of an idealistic system than a physiological, humanitarian system.

To read all of the articles in the leading literary magazines of the day, on marriage and divorce, is sufficient to nauseate a man. Moralists, scientists, preachers, old maids and childless women, all have opinions on marriage and divorce. All of this raises the honest inquiry, Is not the education of wives and mothers neglected? We have nothing left us, as men, to decide, but that every other husband in this country is a tyrant and a brute. If a man should say that his mother raised ten children and never used a nursing-bottle, nor any patent infant food, there would be a hundred ready to make this inquiry: "I wonder how she did it?" It should be plainly seen that she did not climb several flights of stairs two or three times a week

to find an office of some advertising gynecologist. In that respect she was allowed to live to a good old age without the application of the many specule now used to examine barren women. Yet, society to-day demands barren women, while the mothers will do very well for the drudgery of life. It may be set down as a physiological fact, that the more nearly the education of the female sex approximates that which is alone intended for the male sex, the more masculine and the less feminine the female becomes. While those organs which can be developed for the accomplishment of masculine tasks, in the female, may be developed, that development must take place at the expense of the organs which can alone gratify the female for natural requirements and duties.

It is a well-known fact that the female organs of generation—the organs which nature designed for the reproduction of the species—and those designed for the nourishment of the infant, have a very close physiological sympathy. If the woman is not womanly and normally developed, she can never be a competent mother. A womanly mother is one whose natural instincts of motherhood have not been warped by artificial training. The closer she lives to nature the more feminine will be her instincts, and she must have genuine feminine instincts to be a good mother.

If there is anything in our system of female education that vitiates feminine instincts and that militates against good motherhood, it should be remedied as a sanitary necessity.

The moral involved should be obvious. The best conditions of motherhood demand that she should nourish her own infant; if she cannot, the next best thing she can do is to nourish it with that which naturally, not artificially, comes the nearest to containing all of the natural elements constituting human milk. We are well aware that the problem of infant-feeding in the cities and larger towns of our country is the "*pons assinorum*" of city sanitarians and hygienists. But for the country practitioner of medicine not so many obstacles present themselves, and he can point to the healthy cow as being able to help him out of the difficulty where the mother is deficient in nourishment for her infant. In many instances if the unfortunate city mother receives an invitation to visit the country, she has the problem of infant-feeding solved, both to the relief of her own mind and the benefit of her infant, by securing good country milk for its nourishment.

A wholesale condemnation of infant foods is not proposed in this paper. Some of them, no doubt, have merit, and may be useful under certain conditions, and especially where the conditions are understood and wisely acted upon. The object we have in view is to call a halt, to some extent, in the pell-mell onward march of so-called science, and have more of the natural ground reviewed in the field of infant-feeding.

From a natural standpoint, the prevention of the necessity for artificial infant-feeding would seem to be the demand of the hour, for the protection of hundreds of innocents. A plea should be made for the cow as being the best handmaid for the mother in the feeding of her infant. In this connection, also, a plea should be made for the infant, and ignorant and conceited nurses should be taught not to overload an infant stomach to prevent it from crying. It is better that a child should cry occasionally from slight pangs of hunger, than to cry from an overloaded stomach and distended bowels caused by over-feeding. For sanitary purposes, one of the best institutions that could be encouraged would be a school for mothers. Schools for nurses have been instituted, but their failures have been commensurate with their stilted scientific pretensions. No matter-of-fact physician can fail to call to mind, in an experience of years, the trouble he has had in endeavoring to save a child or two from being victims to the conceit of ignorant nurses. Such a nurse usually is one who has been schooled in some physician's

peculiar scientific methods in caring for both child and mother. This paper is not designed to deery true science; it is intended more as sounding a note of warning against pseudo science—to call the attention of sanitarians to the fact that infants and mothers of this land should not be made victims of too much science. In the numerous advertisements of artificial infant foods, it may be read between the lines that the advertisers care more for their pockets than they do for the half-starved infants.

There is a moral involved in this question, and, as a sanitary problem, infant-feeding suggests itself to the honest and conscientious physician as being in the interests of morality. With this we leave the question of infant-feeding, raised in this paper, to provoke such discussion as its merits and importance demand before this scientific body.

The next paper was as follows: *

THE PROPER EDUCATION OF WOMAN.

BY R. C. MUSGRAVE, M.D., OF GRENOLA, MEMBER OF THE STATE BOARD OF HEALTH.

We do not deem it necessary to define the term "education:" neither do we intend to enter into an exegesis of the subject, but merely wish to call attention to a few points which are neglected, as well as some points which are redundant in the education of the women of our nation and generation.

We educate our girls, boys, and domestic animals that, to say the least, they may become more useful.

In order that we be successful in any enterprise, we should take into consideration the cost of such enterprise; being careful, always, that in every investment the returns shall cover all cost and a fair per cent. on the capital in stock. To properly educate, with a view to profit, we should carefully consider what line of usefulness the individual, or animal, is best calculated to fill, and educate or train accordingly.

If we educate anything on a line which will necessitate its removal from its natural sphere of action, it will require a greater effort in patience, time and money, than to train it in its proper sphere; and all such improper training lessens its ability and its inclination to perform the work for which it was designed, and if it is forced to follow the unnatural pursuit for which it was trained, it will, in proportion, be robbed of its liberties, and its proper usefulness lessened or destroyed.

An improper education is not only hurtful to the persons receiving it, but is harmful to all other persons who are influenced by them. It is well known that there are few persons in this world of ours, who do not have some influence over another. Then every child should be properly taught, so that its influence will be for the greatest good in all its pursuits in life. Bear in mind that it should be taught some useful occupation. As there are many kinds of useful occupations, so are there many individuals possessing inclinations to follow some one or other of the different profitable occupations.

Each boy should be encouraged in whatever honorable pursuit he may be inclined to follow, and thoroughly educated on that line, that he may be successful in his business.

It is well known that girls have natural inclinations to follow pursuits differing widely from that which interests the boys. For instance, our girls, in their choice of pleasure, very early in life engage in fitting up for themselves a little playhouse, furnish it with whatever scraps of cloth and parts of broken dishes may come to hand—that is, if she is not better supplied by her parents with a tea-set and the proper fabric for her purpose—and arrange them in good style for housekeeping. If she is not furnished a little corner in the dwelling for her purpose, she will con-

struct one outdoors against some building, clean up the premises and beautifully decorate it. In her little home, she will place her little cradle—though she may have to use for it a portion of a broken vessel, or a cupped scrap of board or bark—she will have what she considers a cradle, that she may place in it her well-cared-for doll, though it may be made of rags. Thus, she entertains herself, and is happy. But not so with the boy. He has no pleasure in such amusements. Without enumerating the many pursuits of interest to him, we leave that matter for your consideration, knowing full well that the difference is well understood by all.

By observing this innate difference in the pursuit of happiness existing in the two sexes, we may come to better conclusions as to how to educate each, so that they may be able to obtain the greatest amount of pleasure in their lives, and be of most use to God, their nation and society. Is not this grand republic of ours of sufficient importance to demand of every citizen such ardent love for it, that if need be, they should even lay down their life to preserve it? Then why not take our places in the great drama of life to our nation's best interest, though it may seem burdensome in a few of its demands?

Have the great masses of this Government thought for a moment that it is only a matter of a short time till we will be forced, by ballot, to yield our control to the foreign emigration, or the colored population of these United States? Is it not evident that many localities in the South have passed by majority vote into the hands of the colored population? If we would continue our American Government, on American principles, by Americans, we must properly educate; and as the purpose of this paper is the suggestion of a few thoughts on the line of proper education of woman, we will endeavor to mention a few things which we believe are neglected in her proper education; also some things which are taught her that we consider redundant.

That she should be educated to a high standard, is evident to all who have given the subject proper consideration. During her entire minority she should be instructed in the art of housewifery, which things are too numerous to mention here. Teach her that while she is diligent in the business which belongs to her sex, that she is serving the Lord. Teach her to strictly perform her work for the purpose of serving the Lord. Teach her that the Lord prepared her for purposes of His own, and if she refuse to comply with His purpose, He will surely punish her, both in this world and in the world to come. Make her acquainted with the design that God had in giving her an existence, also, if she would be happy, honored of all men and of God, to yield herself, body and soul, to the will of her Creator. Teach her that Heaven and the welfare of her Government are dependent upon her for their aggrandizement. Teach her that if she fills the purpose for which she was created, she has neither time nor physical ability to spend in a college of law, medicine, theology, nor, in short, any college of business which God has designed to be followed by the male population. Teach her that to graduate in any of our institutions, hitherto designed for the male, does not only rob her of precious physical strength, so greatly needed to be handed down to her posterity, but also lessens her opportunities for matrimony. Every day and dollar that she spends in obtaining such graduation is worse than thrown away, for after she has finished her course she cannot follow the business, that is, if she acts in compliance with the design of God in giving her an existence. Can she reasonably expect to receive a happy admittance into the kingdom of eternal bliss if she coolly and deliberately makes up her mind that she will not obey the commands of God, and determinedly engage in a line of business which will completely hinder her from performing the work for which she was created?

These and many other thoughts on this line should be presented for her serious consideration.

We all know, if we would stop a moment and think, that the woman of large mind and perfect physical development is the better qualified for her task, and is the very woman most needed to give glory to God and her nation. Her mental ability and physical strength are the qualifications most needed for the betterment of society and maintaining her nation's standard. If the strength of a nation, as well as its wealth, is its population, what greater harm can come to a nation than for such women to withhold their strength from it? Do they not know that their influence is doing more harm to our nation than all diseases, pestilences and wars combined? She certainly does know that her influence has been brought to bear upon a large portion of our women in this Government, so much so that very many newly-married ladies are feeling that it is a disgrace to become a mother. In consequence, they have come to about the following conclusion: she desires pleasure in society, and honor in her community; does not wish it said of her as she has heard said by the "fashionable" ladies in society, "Poor, ignorant creature, she has only been married six or eight years, and is the mother of one, or perhaps two children." No; she desires above all things that such shall not be said of her. May God pity such women of this generation in these United States.

From whence came all this evil? Did it not emanate from those "noble" women of higher education? Graduates, prepared by their great learning to sail out from a happy home into politics, seek and hold office, practice medicine as a "regular," or some other M. D., or to practice law, or follow some of the lower callings which do not belong to her sex?

If it is proper for a nation to legislate for the purpose of hindering disease, thereby lessening the death-rate through the combined efforts of the pharmacist, chemist, plumber, sanitarian and various boards of health, State and local, is it not equally important that our women should receive an education properly suited to their vocation, that the world may be bettered by their existence in it?

A short time since, three thousand women in Greece, in their petition to the king said: "If the progress of our country in civilization remains behind the hopes and expectations of the government, the cause is the backward development of Grecian womanhood. Fit us to rear your sons, and we will show you how much we can do for you and Greece." Would to God that such sentiment were instilled in the affection of every woman in this Government. Would it not be wisdom if this Government would furnish every woman in it who has a desire to engage in the pursuits of man, a banner made of such costly material that she would preserve it because of its beauty and great value, made more attractive, if possible, by placing it in a rich and beautiful frame, so that she will be pleased to hang it in her sitting-room, where she can behold its beauty every hour in the day, with that grand sentiment of the three thousand Grecian women printed on it in letters of gold, headed by these words: "This is my motto"? It might help the matter further if she be furnished a second like unto the first, to hang by the side of it, to read as follows: **FEAR GOD AND KEEP HIS COMMANDMENTS.**

If ye walk in my statutes and keep my commandments, and do them, then I will have respect unto you, and make you fruitful, and multiply you. But if ye will not harken unto me and do all my commandments, I will set my face against you, and I will break the pride of your power, and bring your sanctuaries into desolation. Ye shall be robbed of your children.

It is said, "The glory of the Lord is His children." May not the same be said of a nation? or would it be putting it too strong to say, The glory of a mother is her

children? Then, if a woman would be glorious—and we believe that all desire glory—obey the commandments of God. If she would give glory to her nation and to God, obey the commandments.

In what position can a woman be placed where she will enjoy more solid comfort, more glory, honor, love and liberty, than to be in possession of a loving and kind husband: a nice little home, well cared for by proper sanitation; a mother of a half-dozen or more bright, clean and healthy children, and she mistress of the whole outfit? Mother! what name or title, under God, is half so dear as that of mother? Add to this the honor of a mother of a son, or sons, who will fill our most honored positions in this government, church and state. Those places are to be filled by the rising generation, and the women who are the best calculated to furnish sons to fill those honorable places are the very women who are refusing—determinedly refusing—all such honor, choosing, rather, to enjoy the pleasures (?) of office—or some of her mis-calls above referred to—for a season, than to dwell in the God-given privilege for which she was designed by her wise Creator.

I am persuaded that she does not choose to follow such unnatural and unenjoyable pursuits as have been pictured by the foregoing, but has been dragged into them against her will and better judgment through the influence of a portion of our male population, who have been and are advocating woman suffrage. Through the influence of such she has essayed to act in harmony with her tutors, even against her better judgment. She never would have attempted to engage in such unnatural pursuits had she been left to her own will. Satan could not have decoyed her into such unpleasantness; but man, who was ordained to rule, nourish and cherish her, is the only demon that could have prevailed with her to take the step she has, which is so hurtful to her peace and happiness, and which will be, if continued, a greater curse to her than that of Mother Eve. God redeemed the world from the effects of the sin of Eve; but there remaineth no more sacrifice for the woman who refuseth to obey the commandments God gave to her. Then does she not have the right to act in her own best interest? Yea, do not her happiness and the future welfare of our government demand that she call her sisters together and make the demand upon the supreme head of this nation that the three thousand Grecian women made to their king?—Fit us to rear your sons, and we will show you how much we will do for you and these United States.

I am pleased that I can say, to the credit and honor of many of our younger ladies, that they are refusing to be led further into trouble and degradation through the influence of the "fashionable" women, who have been deceived by the demon in the shape of man. They have discovered the hydra-headed monster which is striving to swallow her life, liberty, and pursuit of happiness, and is declaring to the world, through our newspapers, that she will not consent to leave her work undone in order to do the work that God has designed that man shall do. Is not such decision right? Has she not the right to say to the man who has burdened her with his work—that he may sit on and whittle goods boxes till he is too filthy for decent society—to get up and take hold of his work, and allow her to go home and clean up and beautify it, wash and do up his clothes, and patch that portion of his trousers which he in his idleness has worn through? And if he should refuse to heed her call, has she not the right to leave his work undone, that she may be enabled to perform her own work well? Most assuredly she has. Yea, more: Heaven demands it, her Nation demands it, and all that belongs to her present peace and future happiness demand it. Then "suffer little children to come unto me, and forbid them not, for of such is the Kingdom of Heaven," said Christ.

The next paper presented was by H. C. Irish, Esq., as follows.

NUISANCES—WHAT THEY ARE, AND HOW TO ABATE THEM.

BY H. C. IRISH, ESQ., MANHATTAN.

"Nuisance, *nocumentum*, or annoyance," says Blackstone, "signifies anything that worketh hurt, inconvenience, or damages." The learned commentator further classifies nuisances as either *public* or *common* nuisances, "which affect the public, and are annoyances to all the king's subjects," and *private* nuisances, "which may be defined, anything done to the hurt or annoyance of the lands, tenements or hereditaments of another."

To constitute a *public* nuisance, it must be such as affects or annoys the public generally in the vicinity where it exists; or, as one writer states it, there must be such a number of persons annoyed, that the offense can no longer be considered a private nuisance. A public nuisance may consist of the following of some particular trade or calling, in consequence of which the air is rendered noxious or unhealthful, as slaughter-houses, glue-factories, and the like; or a boiler-factory, which disturbs the peace and quiet of a neighborhood; or from acts of public indecency, as bathing in a public river, in full view of neighboring houses; or by acts tending to provoke a breach of the peace, as by drawing together a large crowd to witness some play or exhibition; or the keeping in a residence neighborhood of a gambling-house, bawdy-house; or the exposing in public of a person infected with a contagious disease; or a horse infected with glanders; or leaving exposed in public, dead bodies or carcasses of dead animals.

From the very nature of the case it is difficult, in fact, nearly impossible, to enumerate the instances, or classify the conditions under which a thing may or may not become a nuisance, either public or private. What might, in certain localities, or under certain conditions, be considered a nuisance and abatable, in other localities, or under changed conditions, would not be so regarded; as, the erection of a glue factory in the midst of a number of such factories, unless it materially increased the annoyance, would not be a nuisance, while the erection of the same factory in a populous residence district would become so. Each individual case must be governed by its own circumstances and environment, judged in the light of the general rule laid down in the above definition. The principles governing the law of nuisances are closely allied to that other well-recognized principle of common law, "*sic utere tuo, ut alienum non ledas*;" so use your own as not to injure your neighbor.

A swamp or marsh, while in its natural state, though the exhalations therefrom may be injurious to those residing near it, is not a nuisance that can be abated at law, and even the state has no authority to compel its owner to abate it by drainage, but if the owner does anything upon or in respect to the land which increases the annoyance, he may be proceeded against as for maintaining a nuisance. Unwholesome vapor from an artificial pond is a nuisance, but it may be doubted whether artificial lakes or ponds in a public park, created by municipal authority, would be so regarded.

Constructions or erections for the general use of the public, such as railway lines, street-car lines, etc., cannot, in the absence of some particular or special annoyance, be regarded as nuisances, although their operation results in the annoyance and discomfort of those residing along their lines of travel, and this for the general reason that people who from choice reside in a city, must be considered as having voluntarily submitted themselves to the peculiarities and discomforts of such a life for the greater benefits to be derived therefrom. But if in carrying on their business such institutions should employ agencies which materially increase the danger and discomfort of the people, when other appliances to prevent or lessen

them were available, then for such negligence or disregard of the rights of the public they may be proceeded against as nuisances; as, for a refusal or neglect to employ smoke-consumers, or spark-arresters, or the use of cheap coal or explosive oils for motor fuel, etc.

The erection of a bridge across a river in such a manner as to prevent or impede the use of the stream for purposes of navigation as a highway of commerce, though by State authority, has been held a nuisance. So, in the creation of public improvements, a diversion of a stream or watercourse in such a way as to injuriously affect the lands of adjoining proprietors will sometimes be regarded a nuisance. Filthy percolations, deposits upon lands of another, bursting of water-pipes or reservoirs, falling water or snow from eaves of buildings, drawing off surface-water upon lands of another, detention of natural flow of water, fouling of streams, negligent fires, keeping of vicious animals, noisy, barking dogs, jar of machinery, dust, smoke, offensive odors, pitfalls, and dangerous places, have all, under the definition here given, been considered nuisances, and abatable as such. Indeed, it is difficult to confine within any prescribed limit the subjects which may not, under certain conditions, be included in the list of what the courts may regard as nuisances.

The question what may constitute a *private* nuisance, is referable, in the first instance, to the same general principle enunciated in the definition just given, and the general rules of law applicable are the same, though it will be noticed that in some instances the rule is enlarged, so that what might not be held to be a public nuisance, may, under the circumstances, be regarded as a private nuisance.

Anything done to the hurt or annoyance of the lands, tenements or hereditaments of another, says Blackstone, is a private nuisance. By hurt or annoyance is here meant, not a mere physical injury, but an injury to the owner or possessor thereof in respect to his dealing with, possessing or enjoying them. So it was formerly held, under the doctrine of ancient lights, that he who erected a building in such a manner as to obstruct the view from his neighbor's window already erected, or prevent his neighbor from receiving light and air thereby, was guilty of a nuisance. The law of ancient lights is now exploded, but the principles of nuisance contained in it is still applicable in proper cases. An act which will support an action for a private nuisance may consist in such interference with a public easement or public right as specially annoys or injures an individual, as the blocking up of a public way when one is endeavoring to make use of it. Permitting the water from one's eaves to fall upon the land of another, building a window so that it projects over another's land, though it may not do appreciable damage, are nuisances. No complete classification of those things which may constitute private nuisances can be made for the reason that it must be either greatly extended or it must omit some cases, and for a similar reason no terse definition of "nuisance" can be given, because to make it sufficiently comprehensive, it will be necessary to make it so general that it is likely to define nothing.

In many of the States the legislature has defined by statute certain acts which shall be regarded as nuisances; as, certain acts done in violation of the law relating to the sale of intoxicating liquors, acts relating to slaughter-houses, soap factories, etc. Where a statute thus defines or declares what shall constitute a nuisance, such definition must be regarded both in determining whether the act complained of constitutes a nuisance, and also in pursuing the remedy therefor; but where the act complained of may constitute a nuisance at common law, as well as by statute, it would seem that the rules of construction, and as well the remedies, may be concurrent.

Remedies provided against nuisances are by injunction, proceedings to abate, indictment, and, in case of private nuisances, a suit for damages. It was for a time

contended that proceedings to enjoin the committing of a nuisance would not lie; but it is now conceded that the commission of a nuisance may be prohibited by proceedings on the equity side of the court, and that the court may, upon final hearing, make such injunction perpetual. Instances are common, where there is a statutory declaration of what constitutes a nuisance, of the same statute providing for proceedings to enjoin the continuance of the nuisance, coupled with provisions for its abatement; and in the case of private nuisances, the person aggrieved may have his remedy by injunction to restrain the offender until the final determination of the case, and may then have his order for abatement.

Proceedings to abate, unless taken under the provisions of some statute as a criminal proceeding, now partakes largely of the nature of the equitable proceeding for injunction, are prosecuted to a final judgment and decree of the court declaring the offending act, whatever it may be, a common nuisance and ordering that it be abated; and if not voluntarily abated, the full powers of the court may be invoked for the due execution of the order.

Proceedings by indictment follow the usual course of indictments for other offenses—a presentment to the grand jury, finding of indictment, trial, judgment, and order of abatement.

A party injuriously affected by the maintenance of a nuisance may also have his action for damages; but this will apply only in cases of private nuisances, and where the damage is special.

Regarding the right of a person injuriously affected by a nuisance to abate the same of his own motion, a distinction was formerly made between public and private nuisances, it being said that anyone may abate the former, while as to the latter only the person injuriously affected could act. The rule now is, that where a nuisance is of purely public character, that affects public rights merely, and does not damage one person more than another, there is no one who can abate, and the remedy is by indictment in the courts. Touching private nuisances, the rule is, that any nuisance not purely public in its character may be abated by the party injuriously affected, of his own motion: but it must have become a nuisance, and must at the time be injuring the abator. And the abatement cannot extend beyond the injury; any excess in this respect will render the abator a trespasser. So, too, the abatement must be made without a riot or breach of the peace. The remedy by abatement is a dangerous one. The party proceeds at his peril, and is liable in damages for any error or excess he may make.

We have here given only a brief survey of the law of nuisances and their abatement. The field is an extensive one, with ramifications in every direction, and to proceed with an enlarged view of the whole law, with its many exceptions, would extend this paper to unreasonable limits. The general principle enunciated in the definition of what constitutes a nuisance, here given, applied with sound judgment and discretion to the facts and circumstances of each individual case, will always be a safe guide to determine what constitutes a nuisance, and the proceedings to abate by action in court are never difficult nor embarrassing.

This paper developed quite a lengthy and interesting discussion by Drs. McClintock, Schenek, Welch, Hill, and Redden.

The last paper of the morning session was as follows:

BACTERIA AND DISEASE.

BY PROF. N. S. MAYO, OF THE STATE AGRICULTURAL COLLEGE, MANHATTAN.

There is a peculiar and mysterious something that exists in us and about us on every hand and in myriads of forms and phases. We are so familiar with it that

few people except scientists ever give it a passing thought. Yet if we consider it carefully, we can but admit that the problem of life is the most important one the human mind can grapple with. No one will deny but that life is the basis and superstructure of all in this world and probably of worlds to come.

In past ages scientists have devoted themselves to the study of the highest forms of life, searching for life itself in order to find some method to preserve or prolong it. They studied it in its highest form in the human body. They watched it grow and develop into a magnificent structure endowed with brilliant faculties. They saw life in its marvelous majesty when human life had reached its maximum. They watched it slowly decline until the end drew nigh, when they could capture that something that had enabled its varied and wonderful phenomena to be manifest. But while they watched the body, the spirit had flown. Not a sound broke the stillness as the soul fluttered away. Not a zephyr moved to mark the stroke of its filmy wing. They hacked and haggled every portion of the animal economy in their vain search for life, but it still eluded the keenest knife and the most careful anatomist.

In later times scientists have turned their attention to the enemies of human life. They looked in the vegetable kingdom, and found that same mysterious thing called life. The chemist analyzes and determines the composition of plants, but skillful as he may be he cannot put the separate elements together and form a living plant. Something the most delicate scales cannot weigh nor the most sensitive reaction detect, that one thing — life — has escaped him.

The poets sing to us of peaceful fields and quiet woods, but the scientist will tell you there is war. Everywhere throughout nature one form of life preys upon and gains its existence at the expense of another; every leaf and blade of grass is struggling desperately for its life, not only with its neighbor, but with its invading enemies. Indeed, it is war — ruthless, relentless, cruel war; "war to the knife, and the knife to the hilt!" The beasts, birds and fishes of forest and stream prey upon each other; man preys upon them, and man himself is preyed upon by other living organisms. The greater the difference of dimension of the contending beings, and the farther they are apart in the botanical or zoölogical scale, the fiercer does the struggle become. Man is the highest in the zoölogical, and bacteria the lowest in the botanical; the fierceness and desperation of the struggle we cannot comprehend.

Microbes or bacteria are microscopic vegetable cells, situated close to the boundary line between the animal and vegetable kingdoms. They are the lowest known forms of living matter. Many varieties possess motion. They are colored red, green, black, and yellow, most varieties being nearly transparent. In size they are very small, and cannot be seen by the naked eye; $\frac{25}{1000}$ to $\frac{50}{1000}$ of an inch is a common measurement. Prof. Burrill says: "Increase the height of an ordinary man 1000 times and his head would be over a mile above the earth. Yet, under the same magnification, one of these organisms would have plenty of room to stand on end, dance up and down and swim freely in a film of water between two pieces of glass that adhere closely by capillary attraction. From one hundred to two hundred and fifty, placed side by side, would be required to stretch across the thickness of a leaf of paper."

Bacteria reproduce by division. One cell divides into two. Under proper conditions this process may take place in one hour, and Cohn has computed the increase of *B. Tenno*, under favorable conditions, as follows: One bacterium would multiply until in 24 hours there would be 16,000,000, and they would fill a cube $\frac{1}{1000}$ of an inch across. After 48 hours there would be a pint; 49 hours, 2 pints; 50 hours, 4 pints; etc. Such is the increase by this geometrical progression that after five days the mass arising from one bacterium would fill completely full, or equal in weight, the waters of all the oceans of the globe. You may ask, What is the function

of these bacteria? The function of these bacteria that do not cause disease, seems to be that of decomposition. They reduce all organic materials to its separate elements, so that these elements can be used again. Everyone knows that the plants and grasses of the fields and waysides get their nourishment largely from organized life that has gone before. Some forms of bacteria feast upon the fallen leaves and trees. Thousands of generations in a single season live and die upon them, till the grass and wood are reduced to the dark, moist humus, from which the tender violet pushes forth and modestly hangs her head, and the tall trees obtain their nourishment.

It is bacteria that cause fermentive and putrefactive changes; that cause meat, butter, eggs, milk, fruit, etc., to spoil; and if these bacteria are not present, these substances will remain sweet as long as the mountains remain upon the earth. The grass and trees would never decay; they would bar our passage through the forests, and their withered remains would stand and stare at us much as I imagine the Ptolemies of Egypt cast their ghastly grin upon the sight-seer in the British Museum.

Regarding the function of the bacteria that cause disease, or pathogenic as they are called. There is a theory that they are to prevent an excessive population of the earth, and history bears this theory out to a startling degree. The question has been asked, and seriously, which has the better right to exist—man, or bacteria? To us who believe in the Darwinian programme of nature, it simply resolves itself into the survival of the fittest. History tells us that these germ diseases rage with greatest virulence where the population is thickest; where the surroundings are the filthiest; where the least attention is paid to sanitary and hygienic surroundings. These conditions are not usually associated with an enlightened people, and I would call your attention to the cholera now raging in Spain. It is the survival of the fittest. If man, by his superior knowledge and skill, cannot overcome the invading cells, he is doomed to die. To the biologist for inoculation, to the sanitarian physician, and sanitary associations for improvement of surroundings, must man look for help.

There is but little doubt that disease-producing bacteria exist nearly everywhere in the temperate and torrid zones, but not always in sufficient numbers to cause disease; and we must prevent their increase if possible by removing and doing away with all substances and conditions that favor their growth. Of course there are many kinds of bacteria that do not cause disease, but why one variety will cause disease, and another variety that cannot be distinguished by appearances will not cause disease, we do not know; but they never do. Klein says: "You may as well try to change the onion bulb in the deadly colchicum as to change a non-pathogenic variety to one that will cause disease."

There are three theories given as to how bacteria cause disease:

1. By absorbing the nutriment, they starve the body and cause disease.
2. Struggle between the invading cells bacteria and the cells of the body—white-blood corpuscles—may cause disease; for these white-blood corpuscles seem to watch for and eat up the germs, if they can.
3. The third and most probable theory is that bacteria excrete a poison, which causes disease. This is well exemplified in cases of blood-poisoning, so called. Some disease germs exist in the air, and when breathed into the lungs may cause disease, as consumption. Others cling tenaciously to our skin and clothing, or from the air alight upon a raw surface, and cause pus or matter to form gangrene or blood-poisoning. Others attack various glands, as in mumps or typhoid fever. Some we may eat with our food, or drink with our water, or acquire by contact.

In order to multiply and develop, bacteria must have a certain degree of warmth, moisture and nutritious substances to live upon—all requirements which are found in the human body. The question is, how can they be kept from invading our bodies? Some of the reasons may be as follows:

1. By the removal or quarantining of persons, things and places infected with disease germs.
2. By inoculating against those diseases where science provides a remedy.
3. The proper inspection and cooking of food and water; for thorough cooking destroys all germs.
4. Proper hygienic and sanitary surroundings.

The question as to how inoculation produces immunity, is one still at issue, and there are three prominent theories:

1. That the struggle produced by inoculation between the invading cells and the cells of the body strengthens the body cells so they are enabled to resist other attacks.

2d theory is, that the bacteria when inoculated absorb a chemical substance found in the body which is necessary for their existence. When this is absorbed no other like germs can live.

The third and most favorably received theory is, that these bacteria excrete a poison which so poisons the body that future invaders cannot live.

When science shall prepare the means for the proper inoculation against these terrible diseases, there is no doubt but that man will live a much longer life. Diseases will be rare and injuries not dangerous unless vital organs are injured.

To whom must we look for aid? To the sanitarian, for improved surroundings, food, etc.; to the biologist, who works over his microscope and studies out the problem of inoculation. These are the saviors of the race, and if they are regarded as cranks at present, future generations will rise up and call them blessed.

People have been pleased to imagine Death as an angel, flopping along at a tremendous rate, with a huge scythe upon his shoulder. If this dread visitor were pictured as a cloud of deadly bacteria haunting crowded cities and filthy places, sent by Him who sends all life, and for a definite purpose, it would be a picture more in accord with the views of modern scientists. When the attacks of these deadly enemies can be prevented by inoculation and proper sanitation, methinks the Angel of Death must needs abandon that rather ancient implement he is pictured as carrying, and avail himself of harvesting machinery of a later and more improved manufacture. Says Dr. Billings: "Disease is no longer regarded as a mysterious something originating in a mysterious nowhere, cherished and protected by various hobgoblins of good or evil, as the case may be; and the vague references to impurities of the blood, chemical dyscrasia, germs, epidemics, etc., are regarded as speculations without basis."

Disease-producing bacteria to-day cause more devastation to the human race than wars and accidents combined. 125,000 people die annually in the United States from consumption alone. Add to this list the victims resulting from small-pox, scarlet fever, yellow fever, typhoid fever, diphtheria, cholera Asiatica, mumps, measles, malaria, gangrene, septicemia, syphilis, and other diseases all believed and many known to be caused by germs, and the result will be appalling. Says Prof. Austin: "Wars are children's games compared with these silent, invisible, deadly enemies which are ever about us waiting for an unprotected spot on which to attack us. They have neither conscience nor feeling. They are the seeds of death. The existence of these silent, invisible, deadly enemies means misery, agony, and death to the human race. They respect neither rich nor poor, sex, station, nor age. The issue is fairly before us. Let no man slight it or undervalue its magnitude, for they are enemies which cannot be laughed or reasoned away. It is simply a struggle for

existence between a higher and a lower form of life. The question is, which will be victorious?"

The above paper was very ably discussed by Dr. Roberts, Prof. Kellerman, Dr. McClintock, and Prof. Mayo.

At the close of this discussion, the convention adjourned until the afternoon session.

THIRD SESSION.

MANHATTAN, December 5, 1890 — 1:30 P. M.

The convention assembled promptly at the appointed hour, and was called to order by Prof. Geo. T. Fairchild, one of the vice-presidents, who presided during the afternoon session.

Very interesting music was rendered by the College orchestra.

For want of time, none of the papers during the afternoon session were discussed.

The first paper was as follows:

SANITATION—ITS OBJECT AND SCOPE, AND LEGISLATION.

BY R. A. WILLIAMS, M.D., OF OLATHE, MEMBER STATE BOARD HEALTH.

Sanitation has for its object the health, preservation, and prolongation of human life, reaching that object by investigation, elimination, the causes that destroy life, individually and collectively. The scope of sanitation is limited only by the wants and civilization of mankind. It enters into every department of life, pointing out the influences that are potent for evil.

The length of the lives of those we love, and our own, can be measured by our knowledge or ignorance of sanitation, and our application or non-application of those laws. Among the things that sanitary science has taught is the amount of air that is necessary for our existence and the full performance of the organs of respiration; the deleterious poisons, and the quantity of those impurities, that prove destructive to life and health; the composition of pure and impure air. It has taught us how to avoid propagating those specific diseases that breed typhoid, scarlet, diphtheria, yellow and other fevers that are suspended or carried in the air, as well as the germs of cholera. Also, that certain trades of man throw off minute particles of soot, coal, fibers, and dust of stone and iron, and other ores, thereby producing certain diseases, as well as gases, that arise from the earth; certain manufactures that also produce certain specific diseases.

From sewers and decomposing animal matter, poisonous vapors arise, and it has taught us how to build and how to properly ventilate our public and private buildings. Also, it has investigated our water-supply, its source, and what to and what not to avoid, and by analysis we can tell the impurities that it contains, and the amount of organic and inorganic material. And as water is the greatest known solvent, enters into the human economy by various channels, the importance of our knowledge on this subject is only second to the air we breathe.

We know that climate and climatic changes each produces its own particular disease; and that even in the most deadly climates, by using certain precautions and properly-constructed dwellings, water-supply and sewerage system, attention to personal and public cleanliness, the death-rate is lessened one-half, or more; and that those who suffer from pulmonary and other diseases of the respiratory organs

should not live in a changeable and variable climate, but they enjoy better health and live longer in a climate that is equable. Also, that for persons suffering from indigestion and liver troubles—malarial poisons—a removal to the North, towards a non-malarial locality, will effect cures that medicine cannot reach; for it is dangerous for a Northern man to go South in the heat of summer, as it is apt to produce a sluggish, torpid condition of the liver, and he succumbs more readily to malarial troubles than those who are habituated to that climate.

The Anglo-Saxon race has always been superior physically and mentally to those dwelling farther south in tropical climates. It is equally as hazardous for those that reside South to visit the North in midwinter, as they are more liable to suffer from respiratory diseases, such as pneumonia and bronchial troubles.

Sanitation by analysis has proven the quantity and quality of food that is required under different ages and conditions of life—that which is, and that which is not easily digested. The clothing we wear, the disposal of the dead, the soil under our feet, in fact everything that affects our health and lives, sanitary science, like a guardian angel, has continually and faithfully watched, and pointed out our danger—showing us that death lurks in a multitude of forms invisible to the naked eye.

This, then, being the object and scope of sanitary science, it is not a question of wonder that the growth and permanency of nations have depended upon the observance of physical laws and their application and enforcement. Whenever a nation or people has utterly disregarded sanitary laws through ignorance or willful neglect, you will find that during that era its civilization was at its lowest ebb, and the value placed upon human life correspondingly small—crime on the increase, and its death-rate large.

We find that this conflict between sanitation on one hand, and ignorance, avarice and superstition on the other, has been waged from time immemorial, with alternating success. Among the most ancient were the Mosaic laws, regarding the food they ate, their cleanliness individually and collectively, places of encampment, isolation of those affected with loathsome and contagious diseases, and many others affecting the physical welfare of the Jewish nation. The laws of Lycurgus for the promotion of the health and life of the Spartans are worthy of consideration. During the height of the Roman civilization gigantic sewers and aqueducts were built, at enormous expense: they remain to day, as reminders of the importance they attached to that subject. The Roman law provided that State physicians should be appointed, the number in proportion to the size of the town or district. Those physicians formed, collectively, a college for the supervision of public health.

Following on the footsteps of these laws, unfortunately for mankind, it was annihilated in the dark ages that followed, and reason seemed dethroned, and war and murder and rapine seemed to possess the hearts and souls of men, which condition existed until a better civilization dawned once more on the human race.

So the history of sanitary science in the past is more truly the history of the growth and decay of civilization. What a lighthouse is, with its flood of light penetrating for miles into the blackness of night over surging ocean, beckoning to the storm-tossed and lost sailor, showing him the one safe and wind-sheltered harbor, casting the brightness of day over the dangerous reefs and rocks so that he may avoid them, so sanitary science stands in regard to the human family. Although at times this beacon-fire burned dimly, as fast as its watchers became weary of living through watching and personal sacrifices, many, not only without reward but through doing their duty, when they asked for bread received a stone, and became objects of hatred and suspicion. Many have given up their lives in the pursuit of this science and their endeavor to save their fellow-man from his own folly and indifference.

And as the lighted taper falls from the hands of the hero and philanthropist, others grasp it and fill their places; and only the Creator knows how many have laid down their lives and to-day fill unknown and premature graves because of their efforts in the unexplored field of sanitation, themselves succumbing to the germs that scattered disease and death—a travesty on the ingratitude of mankind to his benefactors; and in place of erecting a marble shaft and building arches in commemoration of great kings and emperors, who have destroyed lives by the million, those granite marbles should rest over the graves of our dead sanitarians. So we see how slowly in the past has been the evolution of sanitary science, until to-day its laws are better understood and maintained than during the world's known history. Modern science and legislation on this subject, we might say, only date from the beginning of the eighteenth century. Since then the death-rate has been reduced in many places at least one-half; thereby lessening the amount of human misery and adding to the sum of human happiness. If it has accomplished such wonders in its infancy, what will be the results in the future of saving the life and health remains for unborn generations to record?

I take it for granted to day, that no intelligent and well-posted man or woman will dispute the right or duty of the State to legislate on this subject. Still, it is a lamentable fact that legislation is slow and difficult of enforcement, as it is obliged to contend against a large class that are educated who have given this subject very little thought, that scarcely realize its importance. Others are woefully ignorant on this subject, especially the laboring classes, that have not the opportunity or time to investigate. Another obstruction is the intentional or unintentional misinformed legislator, who draws the keen sword of economy, which often destroys health bills that are attempted to be passed. A wise health law is in the interest of public economy, and for every dollar that is publicly expended its return will be a hundred fold. I make this proposition without fear of successful contradiction, that the most false economy that a legislature ever championed or listened to, was the opposing of wise sanitary laws, and the opportunity of educating the masses on this subject. Be it to the credit and intelligence of the American people that in no State of the Union where the step has been taken of establishing State boards of health, and enacting health laws, but they have seen that they have been conducive of good, and money wisely expended, and have never repealed the law or allowed it to die for the lack of appropriation, but have increased their appropriations and amended and added to these laws, in proportion as the knowledge of this subject has advanced.

There are two kinds of law. One the State cannot enforce only as the individual will heed its warnings and teachings; as, first, the importance of personal cleanliness as a religious and physical duty, because it is conducive to health and longevity and wards off sickness; and consequently, a cleanly man often passes through an epidemic of fever untouched, when his filthy neighbor succumbs to the disease. Another reason is, cleanliness is an elevating and refining influence, whereas filth is debasing and often the father of crime. It is impossible to pass a law that will prevent a glutton from indulging himself, and becoming drunk from the gases that his own indigestion produces; or to compel a man who is leading a life of luxury and indolence, that is sapping his strength and vitality, to forego those pleasures and labor as the poor are compelled to do. Neither can you legislate the spend-thrift into an economical man, nor a dishonest man into an honest man, only through fear of detection. Neither can a State legislate a shiftless and lazy man into an honest and industrious man. For all men are not created equal, notwithstanding the declaration of independence; for human beings are not endowed with equal capacity, ability, or opportunities and health. But it becomes the duty of the State

to legislate as far as possible in favor of morality, temperance and industry, as against vice, indulgence and intemperance; for the former are productive of good health and the latter of physical and moral decay. So long as the individual neglects himself and surroundings, without endangering the lives of others, the violation of physical laws brings its own punishment; but it is when the individual, community or city endangers the lives and health of the people, by accumulating, or allowing to accumulate, filth that will breed disease and sickness, or the importation of disease and sickness, it is then the work of the State to step in, pass and enforce laws that should hold them criminally responsible for any result that might be traced, directly or indirectly, to those conditions. If a city should leave an excavation that would result in the loss of life, it would not take a jury ten minutes to hold them responsible. If those same lives were lost through some loathsome disease, contracted as the result of the city's carelessness or false economy in allowing the mass of decomposed material in the streets and alleys, I ask in all justice and reason, should they not be held criminally liable? If my neighbor should endanger my life by the careless use of a knife or a bullet, and continue to do so, the law of the land and of self-preservation would justify me in defense of myself, or any member of my family, if it became necessary, even to the taking of his life. But if that same man should, after repeated warnings, through willful neglect or ignorance, allow accumulated filth on his premises, that by overflow or decomposition cause sickness and death in a member of your family—if you should then demand an eye for an eye, life for a life, the law would class you as a murderer, and you would be held criminally responsible. The proof of the justice of your case, that, though coming through forms invisible to the naked eye, your misfortune could be directly traced to the door of your neighbor, would not be looked upon as a mitigating circumstance, or lessen the severity of the sentence or the punishment that the law inflicts in those cases; and, reasoning from cause to effect, you would be equally justified in the taking of life as though that individual had directly murdered a member of your family by knife or bullet; in fact, more so, because death by either of these would be far more preferable and merciful than that of one by lingering, agonizing, burning fever.

Absence or laxity of health laws is productive of great evil and loss of many valuable lives. Such laws are difficult to enforce, except by education, in rural districts, where the farm-houses are far apart, and the neglected barnyard, barn and other buildings, with their collection of filth, are allowed to remain, and sickness is the result. Although the danger is not so great to community as it would be if the dwellings were in closer proximity, still it is frequently the case that not only the neglectful ones suffer, but it often becomes the origin of endemic and epidemic diseases. Thus, not only the neglectful ones suffer and pay the penalty of their own violation of physical laws, but the innocent, because of their location, are visited by the calamity.

So we see the necessity, as population increases, of the passing of more stringent laws on this subject. With all the advantages that fresh air and country life and labor bring, they are frequently more than offset by surrounding conditions that are fruitful and prolific sources of disease. Notwithstanding a popular belief to the contrary, I take the position that a well-built city, with properly constructed streets and sewers, and pure water-supply and stringent health laws, will have a smaller percentage in its death-rate than the neglected rural districts.

If I had the time, there are many sources that supply us with the comforts and necessity of life that I would like to mention; they all need the watchful eye, to punish unscrupulous and to guard or prevent innocent dealers in articles of food

and drink, that are adulterated; it has been frequently said, and, too, with some degree of truth, that corporations have no soul.

Consulting the Annual Medical Sciences, I find that Putnam published an interesting account of the measures adopted to check adulterations in the community of Scherbeck, Brussels. The police who especially watch those retail dealers who sell their merchandise at prices below those generally quoted, procure samples of the food, and hand one-half over to the analyst, and retain the other half for the disposal of the court of justice, in case proceedings follow. This mode of procedure dates from 1872. In these communities, every person who has bought any article of which the purity appears doubtful, can submit it without expense to the official analyst. In all, 1,928 samples have been examined, of which 232 were found to be adulterated; while sixty-five samples of water were condemned as being unfit for drinking purposes. If such a state of affairs can exist under such rigid inspection, how much larger a per cent. of food would be adulterated under no inspection laws. The nefarious work would only be limited by the amount of patience and forbearance that the people had.

As I have stated, as civilization increases and human beings congregate in large cities, their wants increase; and just in that proportion new dangers to life arise, that before had not presented themselves.

In many cities of the United States, Kansas included, the subject of economical light and heat is of vast importance. Among those who have asked for public patronage and secured it, are the manufacturers of water gas for heating and lighting purposes. You will find many public and private institutions lighted with this gas in our own State, each manufacturer claiming that his or their method contains less carbo-oxide. Still, the fact remains that the principle is the passage of superheated steam through anthracite coal, at a high temperature, which results in merely an odorless gas that burns with great heat but very little light. It emits no odor, hence does not give indications of its escape into the air except by a condition of lethargy and unconsciousness in those who breathe it. This is called fuel water gas. That which is used for illuminating purposes is fully as poisonous, but it gives warning of its presence in the air by the odor it obtains of carburetted compounds from coal naphtha. The State of Massachusetts forbids by statute the manufacture of water gas, and the attempt to have this law repealed has resulted in a protest being signed to prevent by law the manufacture of any gas containing more than 10 per cent. of carbo-oxide.

I take it for granted that the lives of the citizens of Kansas are as dear and as valuable to them as those in Massachusetts. When I mention Kansas, it is with a feeling of pride that I am a citizen of this State, boundless and peerless in her statehood. I take pride in the liberality and generosity with which she provides for the support and maintenance of the public schools, until it is a byword that there is a public school or church on every hill in Kansas. Also, in her generosity to the unfortunate in her midst. Go, visit the insane asylums, the institutions for the deaf and dumb and the blind, the reform school, and others, and you will return with that same feeling of pride that is a part and parcel of every true Kansan—knowing and believing that her people are equal if not the superior of any State in this Union. Here were first planted the seeds of right and freedom for the black man, until they spread all over this Union. Let us hope that since the step forward has been taken in sanitation by establishing the State Board of Health, Kansas will soon lead, and be spoken of as having the largest and being the most liberal supporter of health laws of any State in this Union. And I appeal to the incoming legislators, that, should they find it necessary to economize in the running of expenses of the State, they give this subject their honest and conscientious attention; and I pledge

you my word that I have faith in the intelligence of our Representatives and Senators; that the appropriation for the advancement and education of the people on this subject, for the suppression of endemic and epidemic disease, guarding the health and lives of the people, will be increased as we increase in population, and as necessity demands. The cutting down of the salaries only affects the individual; the cutting down of expenses of the Live-Stock Sanitary Commission might result in considerable loss of capital, which would fall heavily on the farmers of this State. But the cutting down of appropriations for health purposes, or doing away with the health laws, will, as surely as the sun rises and sets, be an invitation to the silent angel of death to enter into our homes, and put out the fires of happiness and contentment within our hearts, so that there will remain but the ashes of misery and of the memory of those we love, and contentment never more can cross our thresholds.

Next in order was the following address:

INTOXICANTS AND HEALTH.

BY REV. D. C. MILNER, D.D., OF MANHATTAN.

According to the classic fable, Pandora was the first woman. She was made in the heavens — each god contributing something to make her perfect. She was conveyed to the earth and given to the first man, who received her gladly. In his house was a mysterious jar, which was not to be opened. Pandora was seized with an irresistible desire to know what the jar contained. She opened it, and there escaped fevers, rheumatisms and various diseases and evils for the body, and cares and sorrows and the evil passions for the soul. The story is an account of the entrance of evil to our world. The contents of the Pandora box furnishes an apt illustration of the influence of intoxicants upon our race. Almost all nations have found some method of producing intoxicants. In this brief paper, we cannot take up the long list. The ones most familiar to us are tobacco, opium, and alcohol. Of these, alcohol, in its various forms, is easily king, and we will devote ourselves to it as the representative of all the rest.

As to the effect of alcoholic liquors upon man, science, as on many other points, has changed ground within the last half-century.

The testimony of our latest science is, that alcohol is one of the chief, if not *the* chief of the enemies to long life and health. If this is true, then a discussion of the relation of intoxicants to health will continue to be an appropriate topic for sanitary conventions, until the public is educated upon the question. There yet exists in the minds of the people, large faith in the value of alcoholic liquors in health and disease. This is manifest, if we consult, for a moment, the reports of the enormous business represented in the manufacture and sale of intoxicants. We believe that among the most dangerous of the delusions that possess our suffering humanity to-day, are the false notions and the superstitions as to what can be done by the use of liquors, or what may happen if they are not used.

Whisky is an abbreviation or corruption of *usquebaugh*, which is a synonym of *aqua-vita*, the water of life. Modern science tells us that the water of death would be a more appropriate title. In this connection, we may remember that an intoxicant is literally a poison. A majority of the late medical authorities declare that alcohol is not a food, but a poison. The use of intoxicating liquors as a beverage is forbidden by science.

In a day when the habit of drunkenness was far less common and the materials for intoxication much harder to obtain, a wise man said, "Wine is a mocker and strong drink is raging, and whosoever is deceived thereby is not wise." How often men in their ignorance or blindness have drunk what promised to give them health

and strength and cheer, and have found it a mocker. There is a popular notion that one can endure cold better by the use of ardent spirits. Science has demonstrated that this is a delusion. It seems to warm the body, but the temperature is actually lowered, and the drinking man perishes much sooner from cold than the abstainer. An eminent authority says: "This feeling of warmth is deceptive. One feels the warm blood rushing to the surface, but the blood is not warmed by the process, but cooled. The deception is perhaps also strengthened by the fact that the brain-center, which gives warning of cold, is paralyzed or benumbed by the alcohol."

Many practical proofs can be given that alcohol reduces the temperature of the body. In the fatal campaign of 1812. in Russia, the French soldiers who used alcoholic drinks were the first who perished with cold, while only a small proportion of abstainers succumbed to the exposure and fatigue.

It has been proven by repeated trials, that the soldiers in all climates, and exposed to heat and cold, rain and snow, endure the hardships best when they are entirely without intoxicating liquors. The English army in Africa, in India, and Canada, have furnished evidence that the abstainers among the soldiers marched better, suffered less from sickness, and had a smaller death-rate than those who took their allowance of grog. This is the more significant, as the contrast is not between total abstainers and drunkards, but between abstainers and moderate drinkers. The soldiers who drank could only get the moderate ration.

Our American army had a like experience; Surgeon-General Frank H. Hamilton, when it was under discussion as to the withdrawing or supplying whisky rations to our soldiers, said:

"It is greatly to be hoped that these experiments may not be repeated in the United States army. We have reached the firm conviction, through observation and experience, that the customary use of alcohol is under no circumstances necessary for healthy persons. We make no exceptions for cold, rain, heat, nor even for the habits of former drinkers when once they have enlisted."

Similar testimony comes from the navy. Once, it was thought an actual necessity to give every sailor his grog; now, thousands of merchant vessels go to sea without any supply of liquors. In a number of countries the use of liquor by the sailors is prohibited. The leaders of the arctic expeditions have generally dispensed with liquors as a beverage.

If it is proved to be true that the use of intoxicants in circumstances of exposure is hurtful rather than helpful, it should be plain that under ordinary circumstances they are not only needless, but harmful.

There is much delusion about the need of liquor for travelers. Some people who are abstainers at home claim that, by the changes of water and surroundings, they need to use wine or other spirits, and regard a bottle of brandy or other liquor as a necessity. What has been said about soldiers and sailors in their more exposed life, shows that this is a delusion. Travelers have experimented here: also, persons who have taken the trip to Europe, and into Egypt and Palestine, with all the changes of climate and water and surroundings, and have taken nothing stronger than tea or coffee, have stood the journey better than the ones who took the "little wine for the stomach's sake." The whole delusion as to the value of spirituous liquors to persons in health in travel, or exposed to malaria, has been effectively disposed of by travelers. One who has traveled much says: "There is no more necessity of drinking wine than of drinking spirits of turpentine (although the temptation may be greater) in Europe, Asia, Africa, or in America."

Dr. Livingstone, the great African explorer, recorded in his journal:

"No one knows the value of water till he is deprived of it. We never need any spirits to qualify it, or prevent an immense draught of it from doing us harm. My opinion is that the most severe

labors and privations may be undergone without alcoholic stimulus, because those who have endured the most had nothing else but water, and not always enough of that."

We believe in all proper efforts to secure a pure water-supply to every community. We believe, also, that there is still need of education of the people in the general safety of water and the universal danger of alcoholic liquors.

A traveler tells that he stopped at a wayside tavern, and in the company was an elderly man who ate immoderately at dinner of boiled pork, potatoes and beans. Soon after, they continued their journey under the hot sun and in a jolting wagon. The old gentleman soon began to writhe with cramps. As he was groaning with pain, he exclaimed, "Dear me! I wish I hadn't drank any of that water for dinner. It's almost killing me. I'll never drink any more of the water without a little brandy as long as I am in California. It really isn't safe." He seemed to forget the pork and beans, and his idea of the peril of water-drinking illustrates a widespread ignorance on the subject.

It may be well to assure people that among the personal risks to health as to what they drink, water-drinking is the least and liquor-drinking is the greatest. The theories and practice of many people would lead to the opinion that water was the invention of the devil, but that wine or other intoxicating liquors were "the true gifts of God." Older men now living remember the day when it was thought a necessity in wheat harvest to have an abundant supply of liquors. It was discovered after a time that the farmers who had no liquor got more and better work in harvest than where it was used.

Our athletic clubs and the trained pugilists find that abstinence from all liquor is needed for the fullest use of the strength of the body. All sorts of physical endurance and complete restoration from fatigue and exposure are best accomplished by rest and good food, and not by use of alcoholic liquors.

According to our best information, intoxicating liquors are not needed to impart strength, to prevent disease, to protect from dangers in travel. It may be, however, that alcohol is of immense value as a medicine. There is no doubt that it has a place and use as a powerful drug, to be used with care. It would be a gain if on every bottle of whisky there could be the skull and cross-bones and the word "Poison," to call for care in its use.

Alcohol has a place in the arts "for mechanical and scientific purposes." Its place and value in medicine are still subjects of much debate among physicians. It is certain that liquor is prescribed less frequently and with far more care than formerly. Many eminent physicians rarely prescribe liquors of any kind, because they have found that the remedy is often worse than the disease. Much use of liquor in medicine is the sheerest humbug. A man comes to some physician and says: "Doctor, I feel dull and torpid; wouldn't a little wine or beer help my digestion?" The doctor, glad to please a patient, says, "Well, perhaps a little would help you." So men supply themselves with liquor and say, "I take my wine under the direction of a physician."

A few years ago a large number of the most eminent physicians in England signed a declaration on the subject of using alcohol. They said in part:

"As it is believed that the inconsiderate prescription of large quantities of alcoholic liquids by medical men for their patients has given rise, in many instances, to the formation of intemperate habits, the undersigned, while unable to abandon the use of alcohol in the treatment of certain cases of disease, are yet of opinion that no medical practitioner should prescribe it without a sense of grave responsibility. They believe that alcohol, in whatever form, should be prescribed with as much care as any powerful drug, and that the directions for its use should be so framed as not to be interpreted as a sanction for excess, or necessarily for the continuance of its use when the occasion is past."

They also declared that people immensely exaggerated the value of alcohol, and as the drinking of liquors is so destructive of health and happiness, urged the med-

ical profession to exert their influence against the use of intoxicating liquors. Dr. Richardson, of London, said that this declaration gave the date of a new departure in the medical use of alcohol.

The American Medical Association has more than once passed resolutions discouraging the use of alcohol in medical practice. Dr. N. S. Davis, of Chicago, President of the National Association, one of the eminent members of his profession, is a leader in the movement against the use of alcohol in health or disease.

The *Scientific American* of a recent date had the following editorial note:

"The theory that whisky is necessary in the treatment of pneumonia has received a blow from Dr. Bull, of New York City, who discovers that in the New York hospitals 65 per cent. of the pneumonia patients die with alcoholic treatment, while in London, at the Temperance Hospital, only five per cent. die."

Our latest medical science largely bears testimony that alcohol is not only injurious to the healthy man, and often dangerous when used as a medicine, but is a great cause of disease and death. A noted physician said: "Of all the evils of human life, no cause of disease has so wide a range, or so large a share, as the use of spirituous liquors; that more than half the sudden deaths are caused by them. When mankind was presented with the art of distilling, no more fatal gift was ever presented either by men or devils." Physicians give a long list of diseases caused by the drink habit or aggravated by the use of liquors. Life insurance societies have discovered that abstainers make better risks. The average life of the total abstainer, according to a life insurance report, is 64 years, and of the drinker, is 35½. Of moderate drinkers, the same report declares that twice as many die as abstainers.

The Board of Health of Massachusetts made a thorough investigation through the physicians of that State, as to the effects of intoxicating liquors upon the health and lives of the people. The testimony given might be summed up in this way: "The effect of the use of intoxicating liquors is here, as everywhere, injurious to health, and destructive of life; never useful as a beverage, and seldom as a medicine."

If there are men in Kansas who call themselves physicians, whose chief business is to stay around drug stores and prescribe liquors to drinking men, they should be exposed to the public and a noble profession relieved from such disgraceful representatives. The business of a pharmacist is certainly highly respectable, and very full of responsibility; but if there are drug stores whose chief business is to sell liquor by some sneaking method of legal evasion, they should be suppressed like any other grog-shop nuisances.

We have some people who will agree to all that has been said as to the harm that comes to health from drinking intoxicating liquors, but will limit its application to the so-called "ardent spirits," and claim that there is safety and health in the use of fermented liquors. Our modern science has also pricked the bubble of the beer delusion. If it is claimed that beer is nourishing, Liebig showed that he could put on the point of his pen-knife all the nourishment the greatest beer-drinker gets in a day. The grain destroyed in making the beer will go very much farther to furnish healthy food. Malt is not so nutritious as grain.

As to the healthfulness of beer, let us take the testimony of a European, Prof. Bauge, in the chair of chemistry of the University of Basle. He says:

"Beer is the worst of alcoholic drinks, because the most seductive. It is asserted in favor of beer and wine that they aid digestion; in fact, quite the contrary is true. Repeated experiments upon men and animals, and upon persons suffering from the ulceration of the stomach, have agreed in establishing this fact—that even moderate quantities of beer and wine are enough to considerably delay and derange digestion."

A prominent scientific journal in America agrees with the European professor. In discussing the question of the disposition to substitute beer for the stronger intoxicants because of nutritive or medical qualities, it says:

"The use of beer is found to produce a species of degeneration of all the organism, profound and deceptive. Fatty deposits, diminished circulation, conditions of congestion, perversion of functional activities, local inflammations of both the liver and the kidneys, are constantly present. Intellectually a stupor amounting almost to paralysis arrests the reason, changing all the higher faculties into mere animalism, sensual, selfish, sluggish, varied only with paroxysms of anger that are senseless and brutal. In appearance the beer-drinker may be the picture of health, but in reality he is most incapable of resisting disease. A slight injury, a severe cold, or shock to the body or mind, will commonly provoke acute disease ending fatally. Compared with inebriates who use different kinds of alcohol, he is more incurable, more generally diseased. The constant use of beer every day gives the system no recuperation, but steadily lowers the vital forces. It is our observation that beer-drinking in this country produces the very lowest form of inebriety, closely allied to criminal insanity. The most dangerous class of ruffians in our large cities are beer-drinkers. It is asserted by competent authority that the evils of heredity are more positive in this class than from other alcoholics. Recourse to beer as a substitute for other forms of alcohol merely increases the danger and fatality. Public sentiment and legislation should comprehend that all forms of alcohol are dangerous when used."

According to the positions taken in this paper, substantiated we believe by scientific testimony, alcohol is not a food, but a poison; it does not strengthen, but weakens the body; it does not protect from disease, but is itself a cause of disease; it is dangerous even as a remedy; it decreases the forces of body and mind, shortens life, and is a source of destruction and death.

Dr. Willard Parker was for nearly half a century one of the leading physicians of our land, a man of great ability and of the highest character. Shortly before his death he wrote as follows:

"Alcohol has no place in the healthy system, but is an irritant poison, producing a diseased condition of body and mind. Statistics show that ten per cent. of the annual number of deaths in this country are due to alcohol; that fully thirty-five per cent. of our insane are so, either directly or indirectly, from its use; and that from seventy-five to ninety per cent. of the inmates of our penal and pauper institutions owe their condition to its influence. Besides this, we find that forty-five per cent. of the inmates of our asylums for idiots are the offspring of parents addicted to drink."

He declared that its use destroys the will, the judgment and the moral sense, and produced a low state of public and private integrity, and said:

"Now the question meets us, How can this destruction of lives, valuable to the State in their productiveness, be arrested and a better condition of things be brought about, so that the burden of our taxation shall be lightened—taxation of which the great proportion goes to support our drinking classes and their offspring? Let public intelligence and public morals be so educated that the *cause* of these things be appreciated, and so appreciated that they shall insist on laying the ax at the root of the tree, instead of lopping off the branches, by *preventing* a traffic in alcohol instead of punishing the unfortunate victims of its use."

The educational work should be pressed from every quarter. It is a gratifying fact that in twenty-seven of the States of the Union, by legal provision, instruction as to the nature of intoxicants and narcotics is given in all public schools. As far as we can learn, the text-books used uniformly teach total abstinence. The work of teaching and training to intelligent total abstinence should go in all our schools, colleges, churches, and Sunday-schools.

The medical profession have been the leaders and teachers as to scientific investigation and instruction, and we still look to them to lead in the warfare against this dread foe of humanity.

Legislation also has a place. In this respect we believe that Kansas leads the world. Our prohibitory legislation is well founded, on the right of a people to protect themselves. It has become a maxim, "What is physiologically wrong is morally wrong, and what is morally wrong can never be politically right."

If the State has a right to punish crime it certainly has the right to prevent crime, and in prohibiting the liquor traffic it strikes at the great cause of crime and

disease. Every man also owes the influence of his own consistent example to every good cause.

We began this paper with the story of Pandora. We may well remember, as we close, that while the evils escaped to curse the earth, Hope was left to cheer. In the mighty conflict now going on between science and ignorance, between light and darkness, between the things that destroy and save, between the drink-destroyer and all opposition to it, we may let hope lead us to think that the coming man, in the day of better things, will neither poison himself with intoxicants nor want to live at the expense of a poisoned fellow-man.

The next paper presented was as follows:

STORE-ROOM FOOD.

BY PROF. NELLIE S. KEDZIE, STATE AGRICULTURAL COLLEGE, MANHATTAN.

Special preparation of food for keeping it beyond the usual time has not only Divine sanction, but Divine example, for we read: "And they laid the manna up till the morning; neither was there any worm therein." One day in the week the food from Heaven had been prepared for keeping.

One source of pride to the good housekeeper is the store-room she fills with food that shall satisfy her household from day to day—even as the Heaven-sent manna gave forty years of life to the wandering Israelites. Some of the contents of this store-room must keep, and often it is the best which we wish to preserve. Cleopatra was far from having Heavenly manna, and she knew nothing of the modern methods of keeping food, but she gave her costliest by dissolving pearls for her table in honor of her guest. All the way down the ages women have tried to put their best before their guests, to save their daintiest for their sick, or to be able to vary daily food by saving from each season the best obtainable. The keeping is the serious part. Even the keeping from day to day of any kind of cooked food in our Kansas summers requires thought as well as does the fitting out of a whaler so the seamen may escape scurvy during all of their five years' cruise.

There seem to be three definite agents at work in the world to destroy most articles of cooked food:

1. Ferments by which the evolution of gases causes the food to effervesce.
2. Moulds attacking articles that are comparatively dry; and
3. Ptomaine poisons of putrefaction which causes the disintegration of animal substances.

Perhaps we are most familiar with the ferments. Alcoholic fermentation in our bread, in making vinegar, and in fruit-cans which are not effectually sealed, is familiar to any housekeeper. When a dish of apple-sauce is set in a warm place, sometimes within twenty-four hours the germs of the microbe, *Mycoderma Aceti*, which constitutes "mother of vinegar," and which are constantly floating about seeking what "they may devour," will have so thoroughly set up work in the mass of cooked apple, that a sharp sour taste, a perceptible effervescence, and a general odor of alcohol may be perceived. We say it has fermented.

For all practical purposes we may safely make the statement that any moist substance containing sugar in limited quantity is fermentable, for in growth the tiny plants take from sugar the elements they need, and those remaining unite with surrounding elements in such a way as to produce alcohol and carbonic acid.

Fruits may be kept from fermentation by drying, by being thoroughly permeated with sugar, which in large quantity is an antiseptic; but by far the easiest, the best, and most common practice, is by heating the fruit enough to kill all germs already in it, and then putting it into some place where no more germs can reach it.

In the homes this is done by putting most fruits, the more acid ones especially, into glass cans. In the great factories, which have done so much toward lightening the labor of the overburdened house-mother, the fruit and vegetables, as well as other articles of food, are put into tin cans and then soldered air-tight.

In using for our store-rooms the canned fruits of the markets, care must be taken that the can was not soldered in such a way that lead dropped into the fruit, for this may be dissolved by the acid fruit juices, and, becoming a compound of lead, form a poison when taken into the human stomach. The fact that some of these poisons are cumulative, while others show their ill effects at once, will account for many peculiar cases of lead-poisoning. The use of lead in the coating of tin being illegal, the chances of poison from the can itself are very small.

When cans of any fruit containing large seeds or stones are kept in a warm place, the stones are apt to germinate unless they have been cooked long enough to kill the germ of the new plant. Cherry, plum, and even peach trees, have vainly tried to overcome the environment of a tin can, and have succeeded so far as to destroy the immediate surroundings.

A tin can sometimes contains a few germs of fermentation, which work as rapidly and well as possible with the limited supply of oxygen obtainable, but they find their utmost endeavor will only suffice to cause the cover to bulge up. Many a can then has a hole pierced in the cover, the gas is allowed to escape, and after the whole mass is reheated the hole is covered by a drop of solder. To all intents and purposes it is "as good as new," but many a sick day for many an eater of canned fruits may be traced to this "reprocessing" of canned goods. The second drop of solder on a can should reject it as soon as a convex cover. If properly filled, the vacuum caused by the cooling of the fruit will have a tendency to make the cover slightly concave.

The product of baking-day is often a source of pride and satisfaction. The bread-jar full of rounded loaves of brown and white bread, the cake-can with its delicate contents, and the rows upon rows of savory pies, may well give joyful anticipation of a few days' rest from much cooking. Sometimes, however, the good pies stand upon a cracked plate, the crack of which has absorbed grease from time to time, until a brown row of rancidity tries to ruin the taste of the once delicious pie, and usually succeeds in giving to the under-crust a peculiar flavor all its own.

Baking-days must not be too few and far between. The moulds which attack bread and cake are fungi, which stand ready to grow and increase wherever they may find a lodging-place. We find that the *Mucor mucido* grows upon our preserves and jellies; the *Ascophora* turns our bread mouldy, and the *Monas prodigiosa* gives us beautiful microscopic trees on the cold oatmeal set away after breakfast. Heat of 120° will not destroy these fungous growths, but raised to 140° they are killed. Hence if they exist in or upon bread, toasting or rebaking will destroy them only if carefully done. We find that stale bread is more easily digested than new bread—not because it is less moist, but because of a different arrangement of the particles. Perhaps this very arrangement, which begins as soon as the bread is cold, is a provision of nature in order to make for the little plants a fit place to grow. There must be a nice distinction between bread that is too new to be easily digested and bread that is too old to be perfectly free from mould. It is found that bread shut up in a tin case which is not hermetically sealed will, in the course of a few months, become simply a mass of mould filaments, the starch being entirely consumed by the mould plants in order to furnish themselves with carbonic acid and water.

When the bread of the European peasant shows spots of red he calls it the "Blutwonder" and is much terrified, being sure it is a direful warning from Heaven; but

if the yellow spots appear upon the milk from his cow the "evil eye" has been cast upon it. In the former case if he would have his baking-day come oftener, and in the latter if his milk-pail were kept clean, he would find that both the warning from Heaven and the effect of the glance of evil would disappear.

The ptomaine poisons are of vital interest to us. They are little known—are less sought for—and, if it were possible, we should all prefer to remain in ignorance of them, for only there do we find bliss in regard to these peculiar "putrefactive alkaloids." But few people escape acquaintance with the chicken pie that was baked yesterday; with the meat salad that was put into a jar and covered closely; with the can of salmon that was opened last night, or with the "fresh oysters" that have ceased to be able to close the shell. And the effect of even one such dish from the store-room will be "family history" for years.

It was formerly supposed that putrefaction was simply oxidation, but late years have demonstrated the fact that it depends upon bacteria, which prey upon all organic matter to reduce it to some inorganic form. If beef were hung up on our Western prairies twenty years ago it simply grew dry and hard. To-day it will become putrid. In this transformation the ptomaines are found. They are transitive and temporary forms. Some of them are active poisons; some are entirely harmless. If a ferment be present the products of the putrefaction will vary according to the amount of oxygen which is obtainable.

While these ptomaine poisons are usually regarded as the result of bacterial life, some of them seem to be purely chemical products, and all seem of a nature not readily preserved, because they pass more or less rapidly from one form to another. A few hours will often carry a fresh fish through the stages where the developed ptomaines will cause poisoning if eaten, to the condition of soft, flabby and intensely offensive spoiled fish. If eaten in this last stage the poisons are quite as intense as at any point in the process of decay, but there is little danger of their being used for food after decay has become apparent, while in the first stages of ptomaine occupation, the taste of the fish may be unimpaired.

The active poison sometimes found in milk and cheese, which we call tyrotoxin, is one of these same ptomaines. The unfortunate cases of poisoning by ice cream, instead of coming from the flavoring extracts, have in most cases been proved to be from tyrotoxin. Usually the cause of the development of this poison can be traced to some introduction of foreign germs, either from impure water drunk by the cow, from setting the milk in impure air, or it may result from shutting the milk up where no circulation of air was possible while it was cooling.

One peculiarity of the ptomaine poisons is the extreme difficulty of destroying them. Cooking tainted sausage, spoiled meat, poisonous ice cream, or tyrotoxin cheese, has no effect on the poison, and there seems to be no way to be safely rid of it except by burying it deeply in "mother earth." Canned meats that show taints may have been infected by germs of putrefaction before they were canned, or they may be opened under conditions extremely favorable to the development of the poisons. No canned goods should be allowed to stand in the can any time after being opened. The larger part of the investigated cases of poisoning by canned goods have shown that the food remained in the opened can some hours before it was eaten. Ill effects sometimes follow the eating of freshly-opened canned meats or fish. In such cases the ptomaines were probably canned with the other ingredients of the can, and have simply been preserved as well as have the meat fiber, fats and juices.

A few of the enemies of the store-room are before us. Their works are various. The effects of lead-poisoning, the dyspepsia caused by eating fermented food, and the disagreeable taste given to bread or cake by the mould that may grow upon it, are not uncommon experiences. Active poisoning from decomposed or mouldy

bread is not unknown; while the extreme nausea, the severe pain, the general collapse of the whole system from ptomaine poisons, are too easily recognized, and are circumstances of too frequent recurrence in this intelligent age.

When we remember that organic germs are at the root of all this destruction of cooked food, we may feel that these microscopic plants are—if not avowed enemies—at least, not our friends. But Duclaux has shown that in the salivary and gastric regions, germs live and multiply apparently for the sole purpose of helping to digest the food. So we find these wonderful families of germs—very like the higher family we are always most interested about—made up of good, bad, and indifferent. Our part is to cultivate the good, avoid the bad, and neglect the indifferent.

The mistress of the store-room carries much responsibility in the selection of the food for her household—for upon bodily health depends, to a great extent, mental vigor—and as she fills her store-room for the future delight of her family, her guest, or her neighbor, her best guide in her selection will be the experience of others, which has been gathered by the guardians of public health. Some Moses must needs interpret the “hidden things of nature,” that the store-room of every home may indeed be a heaven which shall send “in the evening flesh to eat,” and in the morning “bread to the full,” until the family shall “come unto the borders of the land of Canaan.”

The next paper read was as follows:

THE HYGIENE OF THE SCHOOL.

BY PROF. JOHN M. BLOSS, SUPERINTENDENT TOPEKA PUBLIC SCHOOLS.

The subject assigned to me by your committee, “The Hygiene of the School,” is coördinate in importance with any subject to be discussed before this convention. In fact, the awakening of public sentiment to the importance of this subject opens up the whole field of sanitary science. Nor is there any means by which reforms can more readily reach the people than through the public school.

It will be impossible to discuss fully the whole subject of the Hygiene of the School in this paper; hence in some cases I shall only suggest the topics which may be discussed. Among these are:

1. The proper location of the school building.
2. The proper lighting and the necessary floor space.
3. The cleanliness of floors, furniture, and grounds.
4. The cleanliness of the pupils.
5. The proper heating of the rooms.
6. The proper ventilation.
7. The thorough destruction or removal of all the excreta from the premises.

The first four topics may be rapidly passed, not because they are less essential, but because to these subjects the public mind has been more thoroughly awakened. Yet we still find school-houses being constructed upon the “highest hills and in the lowest vales,” chiefly because the sites are beautiful or cheap.

The proper lighting and the extent of floor space for the school building are subjects of great importance, and in all buildings recently erected in the West they have received much attention. It is true many old buildings should be pulled down and reconstructed. They are as dark, gloomy, and forbidding within, as the prisons of the middle ages.

The cleanliness of the rooms and the cleanliness of the pupils are largely under the control of the teacher. The introduction of the study of the laws of hygiene in the schools has done much to prevent and to overcome errors in this direction.

Still we shall doubtless find teachers who are not acquainted with the floors on which they daily tread. They may be ignorant or careless, but in either case equally culpable. There are still some, doubtless, who regard spitting upon the floor as *only* in bad taste—impolite. They do not know that the dust upon the floor is a good absorbent of the *sputa* and the excretions from the lungs and skin. They may never have watched the little particles of solid matter dancing in the sunbeams which come through the school-room window. If they have, they may never have thought that these dancing particles might bear in them the seeds of disease—the poisons which they had absorbed. They may have thought these dancing particles were only found in the sunbeam, and that here they came to amuse themselves in a giddy whirl. They do not comprehend the fact that the last class which moved across the floor, the pupils who changed their positions in their seats, and the movement created in the air by the breathing of sixty pairs of lungs, were constantly creating currents and counter-currents in the air of the room—disturbing it from floor to ceiling. They may never for a moment have thought that these dancing particles might contain excreted poisonous matter from the lungs or skin—that they might be scales of cuticle bearing within them the germs of scarlatina or measles.

If Koch's theory that tubercular *bacillus* is the cause of consumption, and that the *sputa* of the diseased contains the *bacillus*, then may we not see other reasons than politeness for not permitting pupils to spit upon the floor, and other reasons than taste for requiring the floors and furniture to be kept thoroughly cleansed?

Boards of education in cities and towns, and probably in most country districts, require that the buildings shall be kept clean. Unfortunately, different interpretations are placed upon the word *clean*. In cities the difficulty in securing cleanliness in the schools lies in the mistaken notion that anyone is competent to be a janitor. The position is generally sought by those who think that the work is easy. The truth is that a janitor needs to be as thoroughly trained for his work as the teacher is for hers, and that just as much care should be exercised in selecting a janitor as in the selection of a teacher. A good janitor, in addition to having the physical power to do the work, and being willing to do it, must be an intelligent man. The floors and furniture cannot be thoroughly cleansed by sweeping and dusting. The floors should be scrubbed once a week instead of once a quarter; the furniture should frequently be washed, and the same is true of the walls. Panes of glass taken from the windows of badly ventilated school-rooms, when subjected to a high temperature, give off the odor of burning hair. This odor comes from the burning of the animal matter deposited by moisture from the lungs and skin of the pupils. Hence it is not dust alone which must be removed from the windows, but decomposed and decomposing animal matter.

The floors, furniture, and walls are subjected to the same conditions as the glass in the windows, and hence should, even with the best ventilation possible, be frequently cleansed.

The cleanliness of pupils is enforced in all good schools. I do not mean that the hands and faces only are kept clean, but that they are required to bathe and to wear clean clothing and underwear.

A room that contains three or four pupils with soiled underwear, whose persons are not acquainted with soap and water, is soon filled with the odor peculiar to dirty linen. Anyone may detect it. Such pupils are a public nuisance, and every good teacher sends them home to be disinfected. Nor have I known any but the most salutary effects to come from such a course on the part of the teachers, when properly exercised. In an experience of several years complaint has been made by but one mother. She brought her son to the office to prove to me that the teacher was

mistaken about the condition of her son; that she was a careful and painstaking mother, and that her son was thoroughly clean and that all his clothing was clean. Examination proved that the mother was correct, but it had been two hours from the time he had left the school-room until he reached my office, and the gentle zephyrs may have had much to do with his renovation.

While much has been done to improve the hygienic conditions of the school, in respect to the proper location of school buildings, to their proper lighting, to the increase of the volume of air per pupil, and to promote the cleanliness of buildings and pupils, yet much remains to be done in creating public sentiment on these subjects and in enforcing hygienic rules adopted by boards of education and health officers.

HEATING AND VENTILATION.

Proper methods of heating and ventilating are subjects which have not engaged public attention more than thirty years. The popular notion of twenty years ago was that carbonic acid was the great evil to be guarded against. To-day it is the animal vapors — the exhalations from the lungs and skin — that are found to be the real sources of danger. But it has been found that the per cent. of carbonic acid in the school-room indicates a corresponding per cent. of animal matter, and hence the per cent. of carbonic acid is now only taken as a measure for the amount of effete animal matter present in the atmosphere, while carbonic acid itself, in the quantities found in the school-room, is not regarded as dangerous or injurious.

So long as large chimneys with log fires were used as a means for heating the school-room, the chimney was the best possible means of ventilation. When the old fire-place gave way to the stove, and the rooms were made tighter and larger, and filled with more pupils, then they placed a pan of water upon the stove, that by evaporation the air might be made moist and pure. They complained of the air which was already filled with carbonic acid, moisture, and animal exhalations from the lungs, as being dry, but instead of being *dry*, it was, as a matter of fact, an atmosphere wreaking with filth.

There are still school-rooms, I suppose, where the pot is kept boiling for the purpose of moistening and purifying the air; school-rooms where the pupils are kept in a feverish, half-asphyxiated condition "from early morn until dewy eve."

METHODS OF HEATING AND VENTILATION.

There are three general methods of heating school-rooms, and a corresponding number of methods of ventilation. The first method is to warm the air in the room by means of the stove or by steam. In this case the only pure air which reaches the room breaks in, like a robber, *in spite* of the closed windows and doors; and the only way for the impure air to escape is through some neglected and undiscovered crack. There is an exception to the above methods of ingress and exit of air only when the air of the room becomes too hot; then the windows are raised or lowered to cool it off. This method of heating and ventilating is probably the rule throughout the country. That is the same as to say that no method of ventilation is provided for in the construction of buildings.

The second method of heating is by means of a stove which acts as a hot-air furnace. An air-duct extends from the outside of the building to a point under the stove. The stove is surrounded by a jacket, which fits closely to the floor. As the air between the jacket and stove is heated it rises, the pure air rushes in, and in turn it rises to the ceiling. The success of this method depends upon the method by which the impure air is permitted to escape. If the windows are lowered from the top, then the hot air which has just left the stove escapes, and the room is left cold and the air impure. If the impure air escapes through a ventilating-shaft by

means of an exit near the floor in the vicinity of the stove, then the room may be properly ventilated, provided the windows are kept closed, and provided, further, that the ventilating-shaft has been properly constructed and is kept sufficiently hot.

The third method of warming and ventilating is by means of hot-air furnaces or by means of steam-coils. In both these cases the fresh air is heated in a chamber exterior to the school-room, and the hot air is conducted by gravity through tubes connecting the hot-air chamber with the school-room. The means for ventilating the rooms in each case are practically the same, viz.: by foul-air flues connecting the floor of the room with a chief flue, in which is created by means of heat a rapid ascending current. The hot air, whether produced by the furnace or by steam-coils, is equal in quality. The only questions which arise as to which shall be used are the following:

1. In case steam is used, the boilers may be placed at a distance from the building, thus removing danger from fires.

2. If the boilers for making the steam are placed in the basement of the building, as the hot-air furnaces are placed, they then become a source of danger from explosion.

3. It costs more for fuel to heat by steam, because of the expenditure of fuel to overcome the necessary friction in the steam-coils.

4. Steam heating requires an experienced and capable engineer to insure success and safety.

The success of this method of heating depends upon two things: *First*, That the amount of pure warm air admitted to the room shall be large, viz.: the minimum five times the capacity of the room per hour; maximum, ten times per hour. The above ratios should be made to depend upon the size of the room, and the number of pupils which it contains. *Second*, The rapidity with which the foul air is removed. The warm air cannot be admitted unless the foul air is removed — two bodies cannot occupy the same space. Air is no exception in this respect to the laws governing solids; hence the means for removing the foul air should be equal to ten times the capacity of the room per hour.

Whether the air in the room is kept pure and warm by these methods will depend upon the capacity for admitting pure warm air in large quantities, and the means for removing the foul air with equal rapidity.

If the means for the exit of impure air is through the windows, or by lowering the windows from the top, then these methods of warming and ventilating fail, as in previous cases.

Experience shows: *First*, that the volume of pure hot air admitted to the room must be large; *second*, that the exit for impure air should be on a level with the floor; *third*, that the best point to admit the pure hot air is near the ceiling, except in the halls, where it should be admitted through a register in the floor; *fourth*, that the doors and windows should be kept closed; and *fifth*, that means must be used to keep the ventilating shaft for the exit of impure air hot, so as to create in it a strong ascending current.

All the above methods of heating and ventilation have been based on gravity, viz.: that hot air will rise, and that cold air will fall. But when strong currents of wind come from a given direction for several hours it has been found difficult to heat that side of the house, because the force of the wind overcomes the weak current produced in the ventilating-shaft.

The best ventilated and the best warmed school-rooms that I have seen did not depend on gravity for getting the pure air into the room, nor for removing the impure. The method is only a modification of the method just described:

First. A tall chimney, or shaft like a chimney, from fifty to seventy-five feet high, is erected near the school building; it may be part of the building.

Second. By means of fans, pure air is taken from the top of this flue and forced into the hot-air chamber, where it is heated by steam-coils or by furnace.

Third. From this room the warm air is forced into flues leading to the several school-rooms.

Fourth. This warm pure air is admitted near the ceiling.

Fifth. The exit of impure air is located near the floor, and connected with a common ventilating-shaft, in which a strong upward current is maintained by means of a fan. By this method perfect ventilation is insured, and only the purest air is admitted to the school-room.

During the summer months the same method is used, except that the air is not heated. The windows are kept closed at all seasons. The air in these school-rooms was always pure and invigorating.

May we not hope that by means of the electric motor, at small expense, we may yet have pure air, cold or hot, forced into our school-rooms and dwellings, and by the same means have the impure air removed?

The question is asked, Why not properly warm and ventilate all our school buildings?

First. It costs from \$3,000 to \$5,000 more to put in first-class heating and ventilating apparatus in a new eight-room building.

Second. It costs more to prepare an old and ill-constructed building for being properly heated and ventilated than to properly construct it in a new building.

Third. It costs more for fuel to properly warm a thoroughly ventilated room than to warm one poorly ventilated, viz, it is cheaper to heat the air which by accident gets into the school-room by stoves or by steam (by which the air is heated over and over) than to force a sufficient amount of pure warm air into the school-room.

Fourth. While there has been a very commendable desire on the part of the public to erect a school building that would be an ornament to the town or city—one with beautiful exterior—less attention has been given to erect one thoroughly adapted for use.

But while it costs more, thoroughly to warm a well-ventilated house, it does not follow that it is the better economy to use the poorly ventilated one; because, in order to secure the best service of the teacher and the best work from pupils, the health of each must be taken into consideration. When this is thrown into the balance, it will be found that the best warmed and best ventilated room is the most economic. Nor have I, in this estimate, taken into account the permanent ill effect upon the health of pupil and teacher.

REMOVAL OF EXCRETA.

The condition of many of the out-buildings which I have examined, shows them to be a moral, as well as a physical nuisance. In villages, in the country, and in some cities, these water-closets are so situated as to best pollute the water of the well. Thus: The ground slopes to the south; the school building is located on the south end of the lot; in the rear is the well, 25 feet north of the house, and 60 feet further north is the water-closet, having a pit from ten to fifteen feet deep. If such a well were to escape pollution after five years' use, it would be miraculous. In cities where there is a system of sewerage and water-works, there is no excuse for making these places a physical nuisance. In the best schools, the basement floor is the location for the water-closets.

Two general systems prevail for removing excreta:

First. The boxes receiving the excreta are automatically flooded every thirty minutes or every hour, and in this way are kept clean. This does not perfectly remedy the matter. There are likely to arise noxious exhalations between the washings, and if there is a defect in the plumbing, a new danger—sewer gas (which cannot be detected by the sense of smell)—may arise.

Second. By the Smead Dry Closet system, or by the Fuller & Warren Sanitary Closet system, the excreta is burned, thus at once terminating its evil effects.

Of these methods, the latter is better, for two reasons:

First. It is equally applicable in towns and cities where there is no system of water-works or sewerage.

Second. When the excreta is carried away by the sewerage of a city, it only transfers the nuisance, but does not abate it.

It was Coleridge who said:

"The river Rhine, as is well known,
Washes the city of Cologne;
But, oh, ye gods and powers divine,
What then shall wash the river Rhine?"

The following paper was then presented:

THE EXAMINATION OF DRINKING-WATER.

BY PROF. G. H. FAILYER, STATE AGRICULTURAL COLLEGE, MANHATTAN.

It was early observed that the water used has often a most intimate connection with health. In many cases the spread of disease was directly traceable to the water-supply. The further observation that the dangerous water is usually that containing drainage from human habitations, led to efforts to obtain a test by which to judge of the quality of water from a sanitary standpoint. While organic matter in a state of decay was considered the only injurious ingredient, its amount would seem to be the proper gauge in comparing the purity of water. This was in accordance with the best knowledge on the subject, and much effort was devoted to a study of the best methods for determining the amount of organic matter in water. From this work have resulted the various methods which have been used by chemists. It is not the aim of this paper to treat of these methods in detail, nor to discuss their relative merits. It is intended rather to speak of the limitations of all methods of examination of potable waters, and of the kind of aid we must expect from such work. These chemical methods are alike in aiming to determine the purity of water from the quantity of organic matter present, rather than from reference to its source. But some of these processes seek to give some information as to the condition of the organic matter. For instance, whether it has passed into the later stages of decomposition, whether it is still in the somewhat stable condition incident to the early stages of decay, or whether the products of the decomposition only remain to indicate what has been taking place within the water.

Thus the well-known Wanklyn, or albuminoid ammonia process, takes account, primarily, of the ammonia given off from the decaying nitrogenous matters by boiling with an alkaline permanganate of potash solution of definite strength; but secondarily the ammonia already existing is determined. This is a product of complete decay. It is fully recognized in this process that there is always some material unacted upon by the permanganate, and that nitrates from oxidation of ammonia will be likely to exist. But neither the more stable organic matter nor the nitrates are determined. But it is believed that the condition of the organic matter being quite as important as the absolute amount, the quantity whose decomposition is completed by the regular treatment will be a good means of comparison. But if we accept all this, and also accept the method as the best, because of its sim-

plicity and ease of execution, or whether we choose some of the more elaborate processes of analysis because of their greater completeness—whatever the process accepted, it so far only permits us to compare, and to say of two waters which contains the more of the objectionable substance. It does not enable us to fix the danger-line, and this is the real question of interest, of course. The quantity of organic matter, in itself is of no consequence and of no interest. We want to know its effects upon the health of those using the water.

Just how much organic matter may be present and the water be a safe water? Some, from a limited knowledge of the subject, have answered that the presence of any organic matter renders the water injurious, and should condemn it. An honored president of this convention, a few years back, in a lengthy address made such a claim, and held the writer up to ridicule for incidentally implying the contrary. A very little knowledge of the composition of natural waters would have shown him that only waters from extreme depths are free from organic matter, and that even this water is seldom so; that, therefore, we are practically compelled to use water containing organic matter, and that such water is generally harmless. As the rain-water falls upon the surface of the earth, it dissolves organic matter that abounds everywhere within the soil and upon it, and carries it into springs, wells, and water-courses. Such organic matter is not necessarily nor generally deleterious. In addition to this, that we may call the natural organic matter of water, the drainage from the habitations of man, from stock-yards, and factories, introduces an additional amount. It is this that is of consequence in deciding upon the character of a water. There is, however, no direct way of distinguishing between the organic matter from these two sources; but before the chemist, from a purely chemical examination of water, can decide upon its quality, he must virtually do so. In some sections of the old country, standards of purity have been adopted from a comparison of their natural waters with those that are known to be contaminated with sewage. But our country is so large and so new that the normal character of the drainage-waters of few districts have been studied profitably; and yet the importance of knowing the character of the uncontaminated water of a region, in deciding whether any particular sample of it is suspicious or dangerous, is too obvious to require argument. In the absence of this knowledge, the chemist is compelled to use foreign standards of composition and then exercise his best judgment, using the chemical facts and those that may be gleaned from an examination of the premises. It is plain, I think, that in extreme cases only can a decisive answer be given regarding the quality of water from a chemical analysis. If the organic matter, as such, were the injurious ingredient, the case would be less difficult.

The question whether or not organic matter in a state of decay can determine attacks of disease will not be discussed in this paper; but surely micro-organisms are the active cause, and their presence is requisite. No chemical examination can show the presence or the absence of these organisms. But such examination may be serviceable in at least two ways. 1st. Organic matter in water may serve as a natural culture fluid, in which the organisms increase and develop to such an extent that the water becomes much more virulent. This may be an exceptional case. 2d. An unusual amount of organic matter may be due to drainage which carries in disease germs from infectious localities. But since the organic matter may be present without these germs, a *suspicion* is the most that can be positively said. This, the suspicion that the relatively large quantity of decaying substances may have brought in dangerous organisms, is the ground upon which water has usually been condemned. When it is remembered that there is always much uncertainty whether the organic matter found is that from natural drainage or whether it comes from sewage contamination, and even if from the latter source, there is the further

uncertainty whether disease germs, as they have been called, are contained in it—when all this is remembered, one may well question a dogmatic conclusion from the results of any of the methods of chemical examination, excellent as they may be in themselves.

It may then be asked whether there is not some more conclusive examination of waters possible. To this it must be answered that this has been the only means available until quite recently. A biological examination may now be had, and this, in connection with the chemical analysis and a search of the premises, gives us the fullest information we can get. But the biological examination is at present quite limited in its scope. A culture fluid may be seeded with the water, and the development of organisms noted with some accuracy as to quantity. But in the present imperfect state of knowledge upon the organisms producing disease, it cannot be told whether the cultures are those that are deleterious, or whether they are our friends in that they purify the water by destroying the organic matter. If the several disease-producing organisms could be recognized, it would be a comparatively simple matter. And further, if organisms fail to develop, it may be due to unfavorable conditions, and not to their absence from the water used to start the culture. If these uncertainties regarding the biological examination did not exist, there would be little use for the chemist in determining the question at issue—the wholesomeness of water. But these uncertainties are of such a kind that we cannot expect them to disappear within any short time, and the chemist will be called upon for the principal contributions to our knowledge of the character of potable waters for some time to come. But while relying upon him, let us all fully appreciate the limits to his powers, and not demand the impossible. We should understand that it is impossible, even by a combination of all means at the command of science, to tell definitely whether a particular water is safe. The most that can be done without a trial of the water is to give the probabilities in the case, and then to say that prudence dictates the following of these indications—it being better to err on the side of safety.

I do not think the chemist need strive to improve his methods, hoping thereby to make his work of more value. As pointed out, the great difficulty is not due to the inaccuracy of his methods, nor to difficulty in interpretation of results; but it is that the problem is not a chemical one. It is biological. The injury is not principally, if at all, from chemical substances, but from living things. About all the new work that chemists can do to increase the knowledge of the water we use, is to determine the character of the uncontaminated water of each drainage region. With this knowledge, sewage contamination could be detected with considerable certainty by present methods. And this is all that chemistry attempts to decide. We can all agree to shun water containing sewage without waiting to have the actual presence of disease-producing organisms demonstrated. It must be admitted, however, that a small amount of sewage, so small as to escape detection, might be so heavily charged with disease germs as to be quite virulent. Chemistry is entirely powerless to combat such cases. If an excuse for thus weakening your confidence in the work of the chemist upon water is needed, I find it in this—it is always better to know the truth. Chemists have known, and realized, and acknowledged the limits to their work on potable waters, but there has been nothing better to substitute for it. They are, therefore, not open to criticism for persisting in it. Although there is no great future for the chemistry of drinking-waters, the biological study is in its infancy. To this we may look for protection. I confidently believe that the problems that are now so perplexing will be solved by this means. As a chemist, I may do no more than express this belief; I cannot aid in the work. But there is an army of workers trained for such investigations; they have already taken it up, and they will

not turn back. But this work will be no holiday task; nor will it be of short duration.

The last paper of this session was the following:

SANITATION IN RELATION TO CRIME.

BY HON. R. A. SANKEY, OF WICHITA.

The present is a period of transition. Forms and usages, hoary with age, have lost their sanctity. Laws and customs—heirlooms of the Anglo-Saxon race—are being undermined. Man fronts the universe and the problems of life in a new attitude. From dependent childhood he is emerging into self-reliant manhood. The iconoclast is abroad in the land, and many of our cherished idols have been shattered, and hopelessly buried. But with the image-breaker comes the prophet of the new order, the ideal dreamer, the founder of new Utopias; and a host of modern Peters preaching a new crusade until the air is resonant with their prophet-calls and rallying-cries.

However diverse and incongruous their methods, they all aim for the accomplishment of one purpose, that is the moral and material elevation of mankind; and this altruistic labor and desire for the improvement of our fellow-man is the one paramount fact conclusively demonstrating the moral and intellectual advance of the race. For the service of self it substitutes the service of humanity. It is the underlying motive from which all true progress must spring. Because progress to be permanent must be founded on the principle that the welfare of part, can only be secured by the welfare of all. The vital interests of humanity are so interwoven that moral or physical disease in one part or portion of the allied political body affects the entire family. Therefore, the reformer who would see his labors crowned with success must include in his methods for the betterment of the race the excision of the moral leper, as well as the temporal evils flowing from unjust laws, class legislation, unnecessary toil, or undeserved poverty. He should recognize the fact that all moral acts are life-promoting acts, and that it is the essential nature of immorality to be destructive—suicidal. That the penalty of evil conduct is the instant and immediate atrophy of character, and if persisted in, is both moral and physical death.

In the civil law, crime is an act done in violation of those duties which an individual owes to the community, and for a breach of which the law has provided that the offender shall make satisfaction to the public. The intent with which the act is done, is the criterion of its criminality. In the violation of the physical laws of life, the intent does not affect the result. Disease and death as certainly follow the ignorant and unintentional violation of the laws of health, as if knowingly and willfully done. Hence, to avoid disease, knowledge of the producing cause and of the means of avoiding it, is requisite to the enjoyment of good health.

Laws, especially criminal statutes, have usually been made to apply only to effects. The idea paramount in the enactment of the statute is the protection of society from the individual who, from whatever cause, becomes dangerous to the lives of others, or a menace to the peace of society. The legislator seldom looks beyond the surface of things, and usually applies his remedy to the cure of outside eruptions alone. The underlying causes producing the criminal have either been unthought of, or regarded as outside the domain of legislation. And this is but natural, considering the fact that our institutions have their root in barbarism, and repression by organized force has been the potent factor in curtailing that barbarism and improving our social condition; and the other fact that many of our modern evils and crimes are the result of numerical aggregation, and social conditions unknown

to our ancestors. Our forefathers enacted laws to meet the conditions of the time, and to subserve a present purpose, and we, under our changed social and political conditions, and with the light science has scattered abroad, should also make our laws to meet the altered situation of things. We have learned that crime is only the effect of some preëxisting cause, and that the wisest method of dealing with it is to discover and remove the cause.

We have learned that it is a social disease of the political body; and knowledge of the cause by which it is propagated and continued is necessary before certain and definite means can be undertaken for its eradication. Crime, like all things else, survives and flourishes only under certain conditions, and subject to certain definite and demonstrable laws. If we understand these conditions and the laws governing them, we can deal intelligently with crime, and like all noxious plants and physical disorders it can be rooted out and destroyed.

Science has demonstrated that heredity and environment are the sources through and by which criminals are propagated; that crime begets crime, and that tainted blood will at some period certainly manifest itself by surface eruption. With inherited moral disease and malformation of character the sanitarian has little to do. His field lies in another direction. With these unfortunates, organized society in the form of law must deal. And to deal wisely, a radical change in legal remedies should be applied. The child inheriting tainted blood and vicious appetites and passions is as truly diseased as the scrofulous or those suffering with pulmonary affections. A weak will coupled with an hereditary inclination to vice is certain to number the possessor among the criminal class, unless death kindly at an early stage cuts off his career. The laws should be so changed as to recognize this class of evil-doers, and treat them as diseased persons as well as criminals; and for the welfare of society at large, drastic remedies should be applied. Why permit the propagation of a class when it is known beforehand that if they live to manhood or womanhood they will only go to swell the list of criminals, and eventually become inhabitants of asylums, reformatories, almshouses or penitentiaries? Is it kind, even to the unfortunate? What good end can be accomplished by permitting the poisoned blood to flow in new veins? Society is organized to protect its members from those who are unable to control themselves. Is it a rational way, to let the disease spread, and keep building hospitals and exhausting the substance of the healthy in maintaining the diseased? Rather would it not be rational to eliminate the disease, and if this is impossible, then to confine it within as narrow limits as possible? Is not this the method yon medical gentlemen take with contagious diseases? The welfare of the morally healthy members of the community is of more importance to society as a whole than the propagation and preservation of the criminal class. This namby-pamby sentimentalism, which looks upon human life, however debased, corrupt and unspiritual it may be, as something too sacred to be treated in a rational way, should disappear. Life is only valuable and sacred when made so by consecrated use, and worthy of preservation and perpetuation when it is devoted to the elevation of mankind. The doctrine of the "survival of the fittest" should be recognized in our dealings with this unfortunate class.

But from this digression I turn with pleasure to that other field where sanitary science can have full scope, and, as the handmaid of the law, be a powerful factor in eradicating crime, reducing the criminal class, and helping unfortunates to a higher plane of life, where it joins hands with the philanthropist in the noblest work man can accomplish for his brother man. It is an old, old saying that "cleanliness is next to godliness," and in the added social knowledge of the present century this saying has become a demonstrated sociological fact—a maxim which no wise person will dispute. It has been equally as well demonstrated that darkness, dampness,

filth and dirt beget moral leprosy, and in these miasma-breeding hot-beds, called homes, crime is born and flourishes until it is sufficiently strong, bold and aggressive to come forth and prey upon society. Sanitation, while having for its primary object the physical health of society, equally promotes the moral health of the community. In fact, its lasting and more permanent effects remain in the improved moral tone of its beneficiaries. All persons are influenced, in a greater or less degree, by their immediate environment, and the more ignorant the person, the greater the influence of his immediate surroundings, because his ignorance limits his mental vision to deductions drawn from his physical senses. Hence, the very class who are herded in cellars and basements, crowded in tenement houses in narrow alleys and filthy lanes, destitute of drainage or pure water, being usually ignorant, are the very class to be most affected by their surroundings. To the educated persons there is a world outside of their physical vision into which they can enter, and at least partially relieve themselves from an unpleasant environment. They can enter a mental world, and carry with them the wisdom of preceding ages; their books can become their companions, and, while surrounded by evil and immoral influences, they can still cultivate their moral faculties. But with the ignorant the opposite is true. His immediate surroundings will either elevate or degrade him.

Man is a gregarious animal, and finds his greatest enjoyment in consorting with his fellow; and any method or system of aid intended to be of permanent value, which leaves out of consideration the potency of this gregarious instinct, must be futile. Hence the sanitarian cannot accomplish permanent good by simply abating the rookery, demolishing the overcrowded, many-storied tenement, and turning the sunlight and pure air into the foul and filthy cellar. While one section is being cleansed, another equally as loathsome and infectious will come into being. His method must take a wider range, and broader scope. The remedy must reach farther back, and plant a deeper root, to successfully overcome the hydra-headed evil begotten of ignorance, filth and disease.

Crime is the costliest product of our civilization, and we pay most for what we desire least. Ignorance, pauperism and crime go hand in hand. Statistics show that with the amelioration of the two former, the latter largely decreases or dies out.

A wise system of government would place in the hands of the sanitary board the power not only to quarantine contagious infections, abate filth, and root out the hot-beds of disease, but also to take such measures and establish such regulations as would remove the cause, and be an effectual remedy against its recurrence. These boards are composed of persons of known skill and standing in their profession; men of probity, culture, education, thought and experience, capable of investigating not only the cause of disease, but of the kindred evils, pauperism and crime, which almost uniformly accompany each other. They are much more competent to meet and successfully cope with these social evils than the average legislator. In that far-off golden age, when the politician shall "have gone to join the troubador and knight-errant," and the government is conducted solely for the benefit of the people, we can expect so much common-sense, discretion and wisdom to be exercised. In the meantime, let us console ourselves with the knowledge that nothing gained is lost. That in the entire universe all forces unite to maintain the advance we have made. That additional knowledge of human nature and its many-sided phases will enable us, individually, to accomplish something toward the abolishment of its greatest drawbacks.

If ignorance is the cause of crime, why is it not the duty of the Government to see that the child is placed in school, and kept there during school age? When it becomes a criminal the State confines it for the protection of society. Would not society be equally protected if the child, by reason of education, was prevented

from becoming a criminal? And would not the child be of greater benefit to himself, and hence of greater benefit to society?

If the tendency to commit crime is a disease, why is it not the duty of the sanitary board to include the prevention of crime among its duties? at least to investigate and report whether this assumption is correct or not; to suggest some rational method of prevention, and some sensible method of cure? Surely if it is a disease, then our method of punishing criminals is at fault, and should be abrogated, and a better one substituted. Present methods proceed upon the theory that the criminal is a rational, responsible being, and that the crime was committed willfully, with intent to violate the law, and against the good order and peace of society. If this is an error, and crime is the product of mental disease, none so competent to explain and demonstrate this error as you, gentlemen of the sanitary board.

We have discarded the belief that an epileptic fit was evidence of the possession of evil spirits; but if it be true that crime is the result of mental disease, we still labor under an error almost as barbarous. If it is true, does it not account for the maxim, "once a criminal, always a criminal"? And for that other fact that almost every criminal once confined in a penitentiary, again finds his way back. It would also account for the persistency of criminals in following the same line of criminality. It is doubtless within the experience of each of you, to have known some criminal who persistently repeated the same character of crime, even when he must have known, if capable of reasoning, that he would be detected, and escape be impossible.

I suggest these matters as food for reflection, and in the hope that sometime our Government will be sufficiently wise to institute a thorough inquiry into the matter, and have the truth determined. Punishment, to be remedial, must have in view the end to be accomplished; and to accomplish those ends it must be based upon an intelligent understanding of the cause of the crime. Let us hope that while the very foundations of our social system are being questioned and attacked, that this one, of the cause and cure of crime, may not be overlooked. It stands at the threshold of social progress, and in this utilitarian age may not receive the consideration it deserves. Crime is a cancer that is forever sapping the vitality of the social body. Its tendency is eternally downward, and it is only by organized, vigilant resistance that it is kept at bay.

The hope of the future lies in the increase and general diffusion of knowledge; the awakening of moral conscience; the change of environment of the viciously-inclined; the removal of pauperism, and the increase of individual homes.

Crime will cease when the temptation to commit it has been removed; or when the individual has thoroughly learned that evil and crime are self-accusers, and for which atonement must be made, now and here.

The convention then adjourned until the evening session.

FOURTH SESSION.

MANHATTAN, Dec. 5, 1890—7:30 P. M.

The convention was called to order by Dr. H. S. Roberts, one of the vice-presidents. The first paper presented was as follows:

THE HYGIENIC PREVENTION OF ZYMOTIC DISEASES.

BY J. MILTON WELCH, M.D., OF WICHITA, MEMBER STATE BOARD OF HEALTH.

Zymotic diseases are such as are supposed to be engendered in the system in a manner similar to that in which ferment is thought to be diffused through a mass in which it has found lodgment.

According to this theory, the contagion or poison of small-pox, for instance, having found entrance to the system, begins its work of diffusing itself by growing, and contaminating as it grows, the fluids of the organism, until the whole has been saturated and infected, when it manifests itself by the peculiar symptoms known as those of small-pox.

That zymosis gives the true explanation of the manner in which disease-poisons affect the system, or that some other—as the germ theory—is more or less nearly the correct theory, I shall not stop to inquire. Knowing just how a disease is propagated, does not seem to have had much influence in controlling it, or confining it. The only thing that seemed necessary at all, was to have sense enough to know that there are such abnormal conditions as disease. So, in what I have to say, all that will be necessary is the concession that such diseases as are called zymotic do exist, and that they are modifiable by medical treatment, or may be prevented altogether in some instances, by hygienic means.

Some of the diseases denominated zymotic are such as measles, scarlatina, diphtheria, small pox, erysipelas, malarial fevers, typhoid fever, etc., etc.

To show that such diseases may be prevented is the subject assigned for our consideration at this hour.

Prevention is a holding back, a hindering. But hygienic prevention—what is that? I should say that hygienic prevention is any kind of prevention that does not itself produce some other disease. A forcible restraint from exposure to a disease might, in the sense here intended, be considered hygienic. The closing of a school by school officers to prevent the spread of any contagious disease may be considered to be hygienic. A city council might perform an hygienic act in the passage of an ordinance closing certain places of business near an infected dwelling. An ordinance requiring that filth, garbage, and other pestilential-breeding rubbish, should be removed, not only from the streets and alleys, but from back yards, and wherever else it may be found, would be an act highly hygienic in its intention. If such ordinances should be obeyed, and the cholera should visit the neighborhood, it might prove to be one of the means—indeed *the* means—that would frighten the disease away from a city. All would be ready to admit that it had proven to be an hygienic measure, and that it had prevented the cholera and saved the city. Disinfecting rooms and buildings where contagious diseases had been known to infest the inmates, burning clothing, ventilating the premises, and otherwise rendering the building free from contagion, would all be hygienic prevention of disease. All such things as prevent persons from exposure to disease might be admitted to be hygienic prevention.

In this paper it must not be expected that a separate treatment of how the different zymotic diseases may best be warded off by hygienic living will be attempted. The time allotted will allow but a very brief and general treatment only. If it can be shown that right living, together with other precautions, may, and often does, render zymotic diseases mild, at least apparently mild, if it does not entirely prevent an attack, then the reasonableness of insisting upon the use of hygienic measures while one is yet well, at once becomes apparent.

Prevention must anticipate the coming of disease, and make preparation against its entertainment when it insists on being domiciled. It is no prevention to wait till disease has found the door, and made its entrance into the living body. Even vigilance in the use of hygienic measures may not always prove to be sufficient to prevent disease; but no sane person will deny that putting the organic house in order, and keeping it so, will so fortify the system against disease that when disease does attack its chances of regaining its lost balance of power will be very much increased. A system thus prepared in advance will be able to adjust itself much more

readily than one which is in feeble health when exposed to disease. This will be apparent from the character of the disease itself. It may on this account seem to have been subdued into comparative mildness.

Let us take one of the diseases said to be zymotic in its character—or, rather, in the manner in which it develops—as an illustration of how it may be prevented by attention to some things called hygienic. Scarlet fever is a disease that may either be prevented altogether by the use of proper precautions, or very materially modified by the condition of the sufferer at the time at which it may be exposed to the disease. A child attending school is exposed to the infection of scarlet fever. It has been unavoidable on its part. No one, perhaps, is to be censured, for the exposure may have been purely accidental. Being exposed, there is perhaps no way by which the disease can be wholly arrested; so the child is fated to have the scarlet fever. Under these conditions, nothing is left but to rely upon the skill of the family physician and good nursing. It is too late now to think of employing hygienic measures for warding off that disease; it is already here. Such measures may, however, lend an impulse toward mitigating the intensity of the disease; but nothing further than mitigation need be expected. The time to benefit by such measures is past. In this case, at least, it is so. It is true that cleanliness, disinfection, proper ventilation, regulated temperature—all hygienic measures, and important ones, too—may, even in this late hour, be worth very much to the little sufferer; but these will be employed only as aids in the treatment of a disease already established. Such measures, applied at so late a date, are not preventive in the sense implied in our subject.

Let us turn attention to another view. Anything, itself not producing another disease, that prevents disease, will, I am sure, be conceded to be hygienic. We have supposed our scarlet-fever patient to be a pupil at school. Suppose, too, it had attended school up to the evening before it was stricken with fever. On arriving home it had complained somewhat. It had been restless and showed some fever during the night. It had refused its breakfast, and at school-time considerable fever manifested itself, so that the child was allowed to remain at home. The disease develops into a typical scarlet fever.

Now, as we have seen, it is too late to attempt prevention in this case. But can others be prevented from taking the disease? So soon as the case is developed sufficiently to determine its character, there is evidently something to be done. It could not be known that the contagion had or had not been developed so as to communicate it to others that had been at school. And hence no one could tell whether or not the school had been inoculated. But what would be the duty of the school officers of that district in such an event? It does not take a philosopher to answer this. Even a child or a half-witted person would say *close* the school so soon as it became known that one who was there day before yesterday has the scarlet fever, and *keep* it closed till it is known beyond a peradventure that no other child has been inoculated with the disease. But why close the school when it is not certain that any of the other pupils will take the disease? That very doubt, itself, is sufficient reason, if prevention of its spread is desired, for closing the school. To close that school under the supposed circumstances might be a hygienic prevention of the spread of scarlet fever. And to stop its spread would be a prevention of the disease in all the children of that school that had not been present on that day, at least so far as infection from this particular case is concerned.

So much the school officers should do to prevent the spread of scarlet fever. Their prompt action might be the means of confining the disease to one case. Equally efficient might their action prove, if the disease were measles, whooping-

cough, diphtheria, small-pox, or itch — though *scabies*, I believe, is not considered a zymotic disease.

Other means may be resorted to that would prevent the spread of such diseases among those not attending school. Neighbors, and even strangers, often call at a house to visit or to obtain some information or on business, not knowing of the existence of a contagious disease, but which they would not do had there been a signal flag in some conspicuous place to attract attention to the danger lurking within. Thus, beside the school officers, the householder and the physician have duties to perform other than that of prescribing for and nursing the patient confined by such a disease. If they do their *whole duty*, they will see that a flag flutters in the breeze as a warning of danger. And if they are not willing, there ought to be some way of *making* them do their duty in this respect to the community.

Might not this flag prove to be a very hygienic prevention, to any that might come that way, of a contagious disease?

But it may be objected, that the closing of school, and the display of a flag, have no hygienic significance. The simple acts, in themselves, may not have such import, it is true; but when they are done with a *purpose* — to stop the spread of disease in a community, then such *acts become intensely hygienic in their character*. It is saying to a monster disease, "Stop, just there; stay thy ravages; let the innocent alone!" And what is this but preventing disease?

Now, suppose that on the last day that our pupil attended school the weather was disagreeable — either raining, storming, or cold — and in consequence, but few pupils of the district have ventured from home; I would ask, have the district school-board done their whole duty, when they had ordered that school closed? Certainly, they have, it may be answered, done all they could, and there is nothing left for them to do. Let us see. It has been supposed, as one of the conditions of this imaginary case, that no one could determine whether our pupil of the scarlet fever had left any contagion in the school-room; but for fear there might be, the officers had closed the school. But they may have been too late; for the contagion may have spread to the few pupils in attendance, that day. Of course this act may be the means of confining the disease, for the time being, to the families whose children were at school that day. But what about those who remained at home on account of the inclement weather? When school opens again, all will come back, both those who have been sick, and those not yet exposed to the contagion. The doors and windows of the school-house had all been closed during the time the school remained suspended, thus confining the contagion and preventing its escape, thereby leaving it in full vigor to infect the children that had thus far escaped. Thus it is plain the school board had not done all that should have been done; had not done all their duty to the pupils of that school; had not done what enlightened sanitarians would insist upon doing.

But what else could they have done? The fear that prompted them to close the school ought to have suggested that the school-house should be thoroughly disinfected with some known efficient destroyer of infection. After this, the doors and windows should have been thrown open for thorough ventilation of the room, for days before the school should again open. The books and other things belonging to the pupils should have been left to be disinfected along with the school rooms. Not till all this had been done would the duty of the school officers to the children of the district have been fully performed.

Such are some of the means that may be employed in preventing zymotic disease. But these are not enough, for such diseases come in many shapes; and in many ways do they insinuate themselves into the graces of the system. They are

enticed often by our methods of living, and often, when we least suspect them, they swoop down upon us without warning, when we are weak and feeble. Would it not then be the dictates of wisdom to imitate the wise virgins by striving to keep our organic lamps trimmed and burning, ready to welcome, if it were possible, to hospitable defeat, these hydra-headed monsters of destruction of the human family?

Then, besides what school boards, town councils, and parents can do in the ways that have been pointed out, there may much else be done by the individual, the family, and the community, to restrict, if not entirely to banish, such diseases as scarlet fever, diphtheria, typhoid fever, small-pox, and other zymotic diseases from the face of the earth.

Among the things that the individual can do to prevent diseases of this sort, may be mentioned that of acquiring and maintaining bodily vigor. This, in itself, might after all prove to be the best preventive against bodily suffering that can be employed or secured. If it can be attained it would, at least, have the advantage over other means of being present with us at almost all times and on all occasions. A person in bodily vigor is one who has successfully battled with the opposing forces with which he has been associated, and, through this struggle, brought his system into a condition of energy that enables him to balance those forces. Such a condition would, no doubt, be brought about partly through inherited energy, partly by his own exertions, and, perhaps, partly by his fortunate residence in a healthful location. If he had received no vicious organic taint from parents, his condition of bodily energy at any time would depend, no doubt, upon his mode of life—upon the manner in which he treated his bodily functions. To aid in keeping this condition, he eats none but wholesome food, at regular times and in the proper quantities demanded by his manner of life. He has regular hours for sleep and uses them for this purpose. He attends to his drinking-water, and uses none but the pure. He eschews stimulants of all kinds that are found to be hurtful. He keeps himself clean, both in body and in thought.

One living thus, is sure to be almost proof against diseases of a zymotic character. It is true, accidents of infection might occur; but even in case of accident he who has kept his bodily vigor up to the standard that due attention to the requirements of healthy living will give, will fare much better when stricken with disease, than had he neglected hygienic measures in times when he could attend to them. One who is thus mindful of his duties to himself, always has a reserve of bodily energy laid up for an emergency, upon which he may draw in case misfortune overtakes him.

It has been said by a living English philosopher, that the first duty devolving upon man is to make himself a splendid animal. If we should all strive to do this, how much better enabled we should be to withstand the difficulties of life, not the least among which are the diseases called zymotic. The better animals we make of ourselves, the better protection could we give to those dependent upon us for their sustenance, to their health, and even to their lives. In every sense—financial, physical, intellectual, and moral—we should be the gainer by making ourselves vigorous, healthy animals.

So the duties, from whatever point we view them, are to live so as to make our lives healthy, in order that when threatened by disease we may depend upon the extra vigor laid away in our constitutions to balance the extra impulses of force hurled against us by disease, thus letting us slip, as it were, out between the contending forces, free from taint of sickness.

Not only do we owe this bodily vigor, arising from careful attention to hygienic living, to ourselves, to those dependent upon us, to the community, and to the State, but we owe it to posterity—to those who will take our places—to transmit to them

bodies that may, by right living, be maintained in health. It is a moral obligation resting upon us as individuals, as a people, as a great commonwealth, to do whatever can be done to arrest the indifference to the need of hygienic living so prevalent throughout the land—if it can be done—in order that health may be the universal heritage of the people.

Whenever we, as a State, a community, or as individuals, shall be convinced that organic energy, engendered by hereditary transmittal and maintained by hygienic living, will conquer more disease and relieve more suffering than all the doctors, then we shall take more pride in cultivating physical manhood, and rejoice that the greatest blessing that can come to us depends largely upon our own exertions. When we are thus convinced, we shall be more careful that our exertions shall, instead of destroying, contribute to the making of the people splendid physical, intellectual and moral animals. And when this shall have been done, it will be found that physical manhood will be, in itself, the most complete hygienic prevention, not only of zymotic diseases, but diseases of whatever nature, and insure health and prosperity to the people now living, and transmit it to the people who shall come after us to inherit the great blessing of perpetual health.

This paper was very freely discussed by Prof. Bloss, Dr. Welch, Col. Tweeddale, Lt. Bouldon, Dr. Williams, and Dr. Roberts.

On motion, it was resolved that there should be no discussion of any of the subsequent papers, in consequence of the number of papers and the time they would necessarily occupy.

The following letter was then read by Dr. Redden :

KANSAS CITY, MO., December 4, 1890.

Dr. J. W. Redden, Secretary State Sanitary Convention—DEAR DOCTOR: It is with the profoundest regret that I find myself at the last moment tied up with some patients whom I have no right to leave, and so prevented from attending your convention. This is a great disappointment to me, for I am an enthusiast (not to say a crank) on the subject of the prevention of tuberculosis, and your organization is the very one before which I am anxious to present my views. Unfortunately, I have been too busy to write a paper such as could be placed in the hands of anyone else to read, and expected myself to speak rather than read before you to-morrow.

I take it for granted that such a body as yours concedes the tubercular character of all phthisis, and the fact that tuberculosis is communicated from man to man and from man to the lower animals, as well as *vice versa*, the tubercle bacillus being the carrier of infection.

The most common method of the communication of tuberculosis from the lower animals to man is by the milk of tuberculous cows. I leave all discussion of this question to others, merely premising that this great and wide-spread evil might be totally averted by the thorough boiling of all milk before use.

Between man and man the almost sole method of communication is by the dried expectoration of the tubercular patient, mingled with the ordinary dust of living-apartments, and inhaled by the future victim of the disease. Therefore the promiscuous expectoration of tubercular matter onto the floors of living-rooms and public places, around stoves and fire-places, into *dry* spittoons, onto handkerchiefs and towels, is the principal method of the propagation of tuberculosis. The wonderful tenacity of life of the tubercle bacillus in the dry state is universally recognized. It is estimated that there are about two hundred thousand tubercular persons in the United States. The average victim of pulmonary tuberculosis may be expected to expectorate *seven hundred and twenty million* tubercle bacilli a day. The

inoculation of less than one thousand tubercle bacilli into a healthy animal has been known to produce fatal tuberculosis.

How fearfully suggestive are these figures when we remember that thousands of school-rooms, court-rooms, theaters, churches, etc., ten thousands of living-rooms, innumerable railroad cars and sleepers, are thus infected by the ubiquitous and ever-coughing and spitting consumptive!

What are we going to do about it? We would not shut our suffering brethren—often our own best-loved—out from among men if we could. But when they and we understand that spitting on the floor or into a handkerchief may be as dangerous to life as shooting your pistol into a crowd, they will stop doing it, and we shall furnish them some safe and convenient receptacle for the dangerous sputum. (Prof. Dettwiler, of Germany, has devised a closed flask-spittoon for this purpose, to be carried about by patients themselves.)

The people need to be educated to provide separate sleeping-rooms for consumptives, devoid of drapery, if possible with hard, painted walls that can be wiped down with disinfectants. Our railroads should be required to furnish special sleeping apartments for tubercular or other infectious patients. I suppose no through train ever traverses the State of Kansas from east to west without carrying some tubercular patient. These and many other suggestions, amplified and defended, I would rejoice to lay before your convention, could I be with you. As it is, I must leave it to you to make to them my apology and to express to them my sincere regrets.

Yours very sincerely,

E. W. SCHAUFFLER.

The following paper was then presented:

THE WORKS AND WANTS OF A STATE BOARD OF HEALTH.

BY H. D. HILL, M.D., OF AUGUSTA, MEMBER OF THE STATE BOARD OF HEALTH.

MR. PRESIDENT: The morning stars sang together as a new world shone for the first time in the firmament. The highest order of created intelligences rejoiced in the advent of a being made like unto themselves; and for a brief space of time harmony was the order on earth. Then the right of the man fashioned after the image of his Maker to enjoy all the benefits shadowed forth in his creation, was disputed by a most powerful and relentless foe. Adam, as we learn from authority which none must dispute, hastened from his shelter under the branches of the tree of life with the awful announcement of an offended Deity sounding in his ear, "Dust thou art, and unto dust thou shalt return," his dream of omniscient endowment sadly ending in the loss of immortality; listened to the voice of an enemy, desired more, and lost all. And our race since the closing of that tragic scene has in saddened train walked in his footsteps, bearing the curse of a broken law by entailment of sickness, pain, death.

To relieve and mitigate this unfortunate condition of humanity, and restore the image lost by the fall, has been the effort of many of the greatest benefactors in the world's history. During the earlier period of man's existence little was known of medicine, and knowledge of disease was a hidden jewel to be discovered, while pestilence walked at noonday, with only the crude appliances of the times to mitigate its sorrowful effects. Man being slow to learn, while asking for health and life, demanded it to be given according to tradition. So it was then, is now, and ever will be, that he who seeks to save life or prevent disease through any innovation will be subjected to suspicion, to rejection, and sometimes the persecution of his kind. Jenner, Koch, Pasteur, Lister, and Beatty have all been denounced as dreamers and accused of cruelty, but love to man and determination of purpose have always conquered at the last. The chains of Prometheus were broken and he relieved of his torture, and rejoiced to see the race for which he suffered minister

around the throne of Jupiter; and He who was condemned and suffered death at the hands of a cruel mob for healing the sick and doing good shall receive the homage of every knee, and every tongue confess *him Lord*; and thus it ever is — those who were under condemnation yesterday are to-day declared to be heroes, and the voices who cried, "Away with them," and the hands which were ready to cast the first stone are now seeking the honor of singing their praise and crowning their heads with amaranthine chaplets; and all who love truth may rejoice that the ignorance and superstition which for so many ages prevailed is passing forever away, and to-day, standing on the threshold of the twentieth century, we view with gladness the clouds parting, and in the light of present knowledge may with hope look into the future, believing that the roseate bands which streak the eastern sky herald the coming of a better day, telling us that brave men have gone down into the cesspools of the world, dragged the slums of society and toiled in the laboratory of infection until the cryptic chambers where pestilential vapors are distilled have been discovered and the means of their destruction pointed out and we are assured that the poisonous breath of the contagion may, with proper treatment, become pure and innocent as the dew which rested upon the primeval hills of the world's early morning.

The fact of a large class of diseases being preventable is undisputed, including some of the most fatal; and the Nation or State which fails in giving assistance in the instituting of preventive measures, is derelict in its duty toward its citizens, and should be condemned at the bar of public opinion. The laws pertaining to health and the prevention of disease have been so formulated and compiled that society is left without excuse if their virtues are not tested, as the principles which underlie and control them are true as those of Kepler or Newton, and have been as conclusively demonstrated, so that the skeptic has only to read and believe. In London, the death-rate was lowered in two hundred years from 80 to 20 per 1,000; the diminution of mortality for England and Wales from 1873 to 1889 was over 15 per cent., and deaths from typhoid fever alone had fallen from 885 per million to 239 per million, and while 52,000 deaths were registered during the visitation of cholera in 1849, only 14,378 were registered during its visitation in 1866; and the same author declares that the plague of the Middle Ages has been vanquished, and many of the most fatal diseases made amenable to preventive measures; and statistics in the United States are no less gratifying. In Michigan, during a period of twelve years, 4,013 lives were saved from diphtheria alone. In Memphis the death-rate was lowered from 35 to 23 per 1,000; and in Chicago the death-rate has been lowered during the last five years from 26 to 19 per 1,000, a saving of nearly 2,000 lives.

While the attainments of like results are assured to us, it must be secured by well-directed efforts, and only through certain channels; and experience has demonstrated that the greatest amount of benefit in the use of preventive measures against disease is secured when directed and supported by and through the power of the Government. In Europe the means employed are usually direct from the Government, acting upon the individual, but in this country, where the Nation is composed of States, there is a division of power, each retaining its proper functions and acting in harmony with the others, but mostly left to the supervision of the States. The principle upon which our Government is administered is that the Government will not do for the State what it can do for itself, and the State must do for the individual what it cannot do for itself; and every citizen of any State is entitled, according to the terms of the contract, to protection of life, as well as property and health, equally with that of person; and in our ethical relations with society we cannot, as individuals, protect ourselves at all times against danger.

A maxim older than the constitution, says: "*Salus populi suprema est lex*" — the safety of the people is the first great law. Then it follows that as it is a fact that

one million of people are dying in the United States every year, and two hundred thousand of them from preventable diseases, and over four thousand dying in the State of Kansas every year, is it anything less than criminal to withhold any means within our power to mitigate these conditions, and prevent as far as possible this useless waste of life? But to whom shall be intrusted the power which is to stay the ravages of death, and secure the best condition of health to the people? Or who shall establish the line of battle and direct the forces in the conflict with disease? We answer, through the organization and maintenance of a well equipped State Board of Health. And this statement needs no labored argument to verify its truth in the States of the Union; it is no untried experiment, as most of them have for several years past supported one, and news has come to me from all along the line through the governors of such States as Illinois, Pennsylvania, Michigan and Indiana, that noble work is being done, and 15 per cent. is given in the saving of life to their efforts; and in Kansas, as unpretentious as have been its claims, has, during the last two years, been the means of saving, according to the best estimate which can be made, the lives of 1,500 persons.

The work of the State Board of Health of Kansas since the date of its organization about five years since has consisted in educating the people in how to protect themselves against disease; to understand the nature and cause of contagion, and the benefits of enforcing quarantines; and gaining their confidence and active assistance in the prevention of disease and the protection of the public health. This has been done through the publication of papers upon these subjects by the ablest writers, the holding of sanitary conventions, and in various other ways. And much of the work has been a labor of love and the path not wholly free from rough places, as the Board has not always had the undivided support of the public. Criticised by its foes, distrusted by its friends, and unappreciated by all; composed of such men as Schenck, Stormont, Guibor and Redden, who have led in the work, and later Johnson, Jenney and others, who have ably assisted in continuing to labor against well-defined opposition, until to-day it stands the peer of any laboring under like conditions, saving thousands of lives, preventing many more from being sick, until it is a power for good in the State.

Its wants are not many, but imperative; and first, we want harmony among the members of the Board. If we would inspire confidence in the public we must manifest the fullest confidence in each other, and, to come up to the highest standard of excellence, fitness should be the test of every appointment.

2. The Board needs the sympathy of the public and coöperation of the press, and cannot succeed without. Any law or method of procedure, to be effective, must have the support of public opinion, or failure will surely be the result. And through the press we must reach the masses. Every newspaper published is a powerful factor in the moulding of public opinion, and can establish either confidence or mistrust in the minds of the people; and I can truly say that to every worthy enterprise they are usually very generous, and contribute a hearty support, and the State Board is under many obligations to them.

3. The Board wants more executive power to enforce its rules; with one exception, I believe, can it act only as an advisory committee, and the means of enforcing that one exception are limited and defective. The Board is expected to abate nuisances, protect the public against the incursions of disease, and use the best means of abatement when it secures a lodgment among the people, the terms of the act creating the Board say, without let or hindrance; yet no direct provision is made to carry these instructions into effect. This idea of administering law is contrary to those of the two highest authorities in the United States, Mr. Hamilton and Mr. Story, who declared that "when a law mandatory in its operation was declared, that it implied with it the necessary power to carry out the order of the

legislature or court." And this power is necessary for the better establishing of quarantines where needed, the abatement of nuisances, and in the collection of vital statistics, which is of the greatest importance.

The State Board needs money, and to carry out the ideas embodied in the formation of a State board of health, must have it. Much of the work done by the members of the State Board has been at the minimum amount of cost, but as the last two wants which I have named must be received through the Legislature of the State, we must trust to their generosity, and it depends on their action whether the Board of Health of the State of Kansas is to become one of the things of the past, or to go on in its career of usefulness until the people of the State will be able to receive the full benefit of what it ought to accomplish. We believe our demands in the past have been modest, and although the amount appropriated for its support has been far below that of most other States, yet I have no criticism to offer relative to its action, and believe the motives to have been good. Each individual member of the Legislature is sworn to protect all the interests of the State, and among the important ones, is that of the treasury. Notwithstanding this, however, but in keeping with the interest of all, I believe that if the incoming Legislature can be convinced that the State Board of Health is a benefit to the people, it will not only continue the existence of the Board, but cheerfully appropriate the means necessary to its support.

According to the most reliable information, cholera is likely to visit this country the coming year; if so, can we, with eight thousand miles of railway within our borders, carrying people of every clime into our State—the dumping-ground of all nations—afford to withhold the amount necessary to protect ourselves against the danger which confronts us, and to carry forward the work of the Board? Let the experience of Florida with yellow fever answer the question. Besides, the people, and especially our little ones, are continuously exposed to epidemics within our borders, such as diphtheria, scarlet fever, and small-pox, which need the constant and watchful care of a State board of health to keep in subjection.

Thousands of dollars are appropriated each year for the erection of buildings and support of the deaf and dumb, blind, and insane. This is right; and I would not make it a dollar less. And while they are so bountifully cared for, are not the little prattling ones entitled to some consideration? Can we afford to increase the danger of having their innocent voices hushed in death, and their little ears unimpressed alike by our cries or complaints by withholding our protection to save a few paltry dollars? Oh, if it was your child or mine, we would cry: "Empty the treasury; only save my child!" And He who unstopped the ears of the deaf, loosed the tongues of the dumb, and caused the blind to see, also said to the nobleman of Galilee, "*Thy child shall live.*" Now, to the powers that be, we commit the future of the Board if we are supported. As in the past, we will give our time and standing, as guardians of the public health, risk our own lives by coming in contact with contagious diseases, trying to secure immunity from it too thers. Shall our star of hope go down behind a darkened west, or melt away like the star of the morning in the brightness of Heaven?

The following paper was then read:

THE RELATION OF ALCOHOLICS TO PREVENTIVE AND STATE MEDICINE.

BY W. L. SCHENCK, M.D., OF TOPEKA, MEMBER OF THE STATE BOARD OF HEALTH.

In an ideal free State the law must protect all the rights and encourage the fullest possible development of every citizen, and every citizen must be a philanthropist and a patriot. In America, patriotism is the rule, and philanthropy as well, in

at least one profession. The code of ethics of the American Medical Association declares it disreputable to hold any remedy, that tends to relieve or cure disease, secret or proprietary, and the true physician devotes much time and thought to the prevention of disease. State boards of health have given their best efforts, usually without pay, to the development of such measures as shall preserve the health, promote the happiness and prolong the life of the people, and have only complained because their power to protect is chiefly advisory. In free dispensaries and in hospital service, as well as in the daily routine of practice, physicians minister to thousands without fee or hope of reward. The broadly educated and thoroughly qualified physician, instead of demanding of the State class protection, only asks higher standards of professional qualification, that the people may be better protected against base and artful pretenders, and pious frauds who commend all sorts of plausible quackery, and patent and proprietary nostrums. As an evidence of their honesty of purpose, their colleges advance the standard of medical education as rapidly as the state of society will permit. The true physician prays not for disease, though living by its cure, but for efficient laws for its prevention, and for officers who will execute them. With very limited powers the Kansas State Board has assumed the right to hold State sanitary conventions, and they have borne abundant fruitage. How, indeed, could it be otherwise, when such men as Judge Humphrey, Judge Horton and Judge Spilman, Presidents Vail, Lippincott, McVicar, Fairchild, Taylor, and Snow, distinguished ministers and teachers, and eminent physicians, have been the educators? They have disseminated light and knowledge on various subjects of personal and public hygiene—the importance of pure air, wholesome water and food; of proper heating, ventilation and light; of school hygiene, and all it embraces; on the importance of vaccination, disinfection and isolation; the various methods of preventing or arresting those terrible epidemics that at times have swept the earth like tornadoes; on the evils of the tobacco and opium habit, and other causes of preventable disease, as well as upon the value to the State of the life and health of the citizen; and yet, by some singular oversight, the giant cause of moral, mental and physical disease, has not heretofore been considered. Dr. Milner discussed the subject this morning, and the time assigned to me this evening will be devoted to the consideration of *The Relation of Alcoholics to Preventive and State Medicines*.

In its consideration we may fall short of the thought of the total abstainer, or go beyond that of the moderate drinker. We will not discuss it from either of these standpoints, but in the light of preventive medicine—sanitary science.

All organized matter is inorganic matter changed by vegetable and animal chemistry, and vitalized, and whenever devitalized, its tendency is to return to the inorganic state from whence it came.

Alcohol is a product of organic matter, containing sugar, glucose or honey, arrested in the process of degradation. While these elements are substantially $C^{12}H^{24}O^{12}$, alcohol is C^2H^6O , and the allied product, ether, is $C^4H^{10}O$. They, together with chloroform, and other agents of the same class, are organic products deoxidized and left with an excess of hydrogen. In all such compounds, the hydrogen demands oxygen. Alcohol and ether are unchanged by the action of the salivary, gastric or pancreatic secretions, and when taken into the body, undigested, they enter the circulation, and demand oxygen from the various organs and tissues with which they come in contact. From the blood corpuscles, which carry the material out of which the body is built, the oxygen by which it is energized, and remove waste products, they demand oxygen, leaving them with an excess of carbonic acid, and so producing anæsthesia and paresis, decreased nervous force, and lessened metamorphosis and bodily warmth. When its moderately free use is continued for

several days, as shown by the experiments of Dr. Beaumont on St. Martin, it devitalizes and erodes the mucous coats of the stomach, and so interferes with the preparation of the material from which the blood cells obtain their supply.

Under the microscope we note other impressions upon these most important elements of the body. In healthy blood the red cells or corpuscles are thin circular discs, slightly concave on their faces. In the blood taken from the circulation of the intemperate the corpuscles are shriveled, often beyond recognition. They lose their circular form, and many are broken up and disappear, these changes being in proportion with the amount of alcoholics consumed, and their strength. When the circulation is completely alcoholized, deep anæsthesia and death follow. If you take two little bladders (kitten's) and put in the one a little diluted alcohol, and then place it in water, the demand of its contained alcohol for water will make it grow plump from absorption of the water about it. Fill the other with water, and place it in alcohol, and it will become lean and shrunken, the alcohol demanding its water. These represent blood cells and the demand of alcohol for water, the last the action of alcohol in the serum upon the blood cells. While alcohol, if sufficiently strong, will coagulate albumen through its demand for its water, when not strong enough to produce this result, it prevents the normal coagulation of the blood and contractibility of the walls of the blood-vessels, and so tends to hemorrhages. Thus we observe how it interferes with vital processes in the elements of the body, devitalizing its tissues, and retarding metamorphosis.

From union in the body of the excess of hydrogen furnished by alcoholics with its oxygen, the alkaline condition of the circulation, necessary to hold in solution its fibrine, becomes acid, the hemoglobin of the blood is diminished, and there is developed through the retention of effete matter hebitization of the nervous system, and a tendency to disease in every organ and tissue; yet not only the masses, but a goodly number of scientists, have considered alcohol a stimulant and nutrient.

Is it possible that an agent that deoxydizes and otherwise devitalizes the great floating capital of the body, its blood; that interferes with both constructive and destructive metamorphosis, those great life-functions that keep the body ever new; that anesthetizes and paralyzes both brain and nerve, organs through whose agency the body recognizes its wants, and generates and distributes the force through which they are supplied, can be a stimulant, a nutrient, or a healthy beverage? Physiological chemistry, pathological expressions and functional results answer negatively. A stimulant—from *stimulare*, to goad—excites vital action. A nutrient—from *nutrio*, I nourish—supports vital action, and functional activity is the manifestation. In the action of alcoholics a seeming result has been accepted for a reality. A man surrounded by financial difficulties does not find his way out through the agency of alcoholic beverages. Under their influence he may feel as rich as Croesus and merry as Bacchus, but intoxication only increases his financial troubles. When called upon to make a speech, a drink may drown embarrassment and enable him to give his whole thought to the subject under consideration, but does it stimulate mentality? Give him another drink, and his utterances are the drivelings of imbecility. It stimulates to physical effort in much the same way. For a time he may lift as though he could move mountains—not because he has gained new strength, but because he has lost a just appreciation of obstacles. Give him another dram, and his muscles become weak and unsteady.

More than a quarter of a century ago I adopted these views of the action of alcoholics. Then I stood almost alone. In his address on general medicine, at the last meeting of the American Medical Association, that Nestor of American medicine, Dr. N. S. Davis, of Chicago, occupied similar ground, and the more the subject is discussed from a rational standpoint, the more general will be their adoption.

Upon no other theory can the various effects of alcohol be understood or explained. While considered a stimulant and nutrient, with power to increase vital activity and mentality, and to prevent pathological expressions, there is little hope of arresting the drink habit on a physiological basis. Science must confirm practical conclusions, and law must sustain science. Statistics prove, and insurance companies, with the practical wisdom and sensitiveness that govern monetary affairs, act upon the fact that the use of alcoholics as a beverage tends to disease and death; the death-rate in every community, other things being equal, is in direct ratio with the amount of alcoholics consumed. Disease—death—is the result of lowered, not of increased vitality. There is no such thing as too much health. Health is the perfect action of every organ and function, and tends to longevity. The increased disease and shortened life in communities where alcoholics are freely used, are evidence that they lower vitality and tend to death.

But death is not the greatest of evils. To die battling for any cause that uplifts and enlarges humanity, is to live forever in its beneficence. It is falling in the ranks of those who load mankind with misery, degradation and crime, that brings the sting of death.

In the predestined drunkard there is a defective physical organization that makes the soul less responsive to motives and less amenable to the will, and after years of alcoholic saturation the man is unequal to its temptations, and drunkenness is a vice whose indulgence lessens the power of resistance and makes its victim more vicious. Drunkenness and debasement are parallelisms, and go hand in hand. Thus during the last decade intemperance has greatly increased in France, and crime has kept even pace with the increase. She now supports one saloon to every eighty-eight of population, and her houses of infamy bear the same proportion. The old story of the temperance of France and Germany, based on their excessive consumption of the milder alcohols, is irrational and untrue.

Mrs. Laura Ormston Chant has said, "Whenever a young fellow boasts of the number of glasses he can drink without his head being affected, he confesses a lack of brain"—both in quantity and quality. Alcohol has an elective affinity for brain matter. The beast can endure more than the man. And when you are told the use of beer and wine leads to temperance and sobriety, you may diagnose the same deficiency. Let us briefly examine the thought of those who teach that alcohol is a stimulant and nutrient.

Dr. Hammond asserts that "it retards the destruction of tissue"; and then says, most illogically we think, "by this destruction, force is generated, muscles contract, thoughts are developed, organs secrete and excrete." Retarded destruction is proof of retarded activity, increased destruction of increased activity. To avoid the inconsistency the Doctor seeks relief by asserting that "it is not at all improbable that alcohol itself furnishes force directly by entering into combination with the products of tissue decay, whereby they are again formed into tissue without being excreted, as urea and uric acid, etc." Wonderful agent! If it retards the destruction of tissue it cannot possibly increase muscular or mental activity, for destructive metamorphosis is the physiological measure of every movement of the body, every action of the mind. Nor is there any escape through the assertion that it generates force by combining directly with the waste products urea and uric acid, using them over in vital processes. Alcohol will not combine with these products, nor will they if retained in the body generate force any more than will the ashes from consumed fuel, if retained in the furnace, generate steam; but like ashes they will interfere with the consumption of new material and the production of new force. But if waste products were retained in the body and worked over by some mysterious undershot process, how could there result increased secretion and excretion? It is

easily demonstrated that the use of alcoholics in appreciable quantities lessens the excretion of waste products through the kidneys, lungs and other excreting organs; that during lactation they prevent the normal destruction of the mammary cells and the secretion of milk. Nor is the experiment of Dr. H. upon himself, whereby through the addition of $7\frac{1}{2}$ ounces of alcohol to his daily dietary there followed in five days a gain of $5\frac{1}{2}$ ounces in weight, any proof that it stimulates vitality, or that waste products are worked over. Waste products are retained. The ruddy-faced London beer-drinker increases in weight, and is often a mass of adipose tissue; but as Sir James Gordon said long ago, "The London beer-drinker wears his heart in his sleeve, and is subject to a death-wound from the claw of a cat or the scratch of a rusty nail." His fat is evidence of degeneration—necrobiosis. Tissues that healthy processes remove are retained, and a slight solution of continuity proves fatal. If tissues are pickled by alcohol, and normal destructive metamorphosis is arrested, and waste products retained in the body, though there may be slight increase of weight, is it not evidence of lowered vitality, and does it not tend to every type of disease as well as the prevention of union by the first intention—adhesive inflammation? If so, upon what physiological law can we conclude that alcohol increases vitality?

Dr. Hammond's conclusions are that alcohol produces, "First, retardation of the decay of tissue; second, diminution of the consumption of fats; third, increase in the assimilative powers of the system by which food is more completely assimilated and applied in the formation of tissue."

If tissue decay or destruction is retarded by the use of alcohol, it is a pathological and not a physiological sequent. Physiologically the destruction of tissue through the attrition of use is the measure of vital activity, and duly balanced constructive and destructive metamorphosis in all properly exercised organs and tissues is the measure of health and keeps the body new and strong. When alcohol is consumed the demand of its excess of hydrogen for oxygen prevents the oxidation of fat and other tissues, and thus decreases the generation of vital force and warmth, and permits increase of weight. Those who believe alcohol a stimulant are correct in asserting that there is lessened destruction of tissue, lessened consumption of fat, lessened excretion of waste products, not only because metamorphosis is lessened, but because the cells that should supply material for vital processes and remove waste are crippled by the action of alcoholics.

Whoever has sniffed the breath or smelled the perspiration of those who have been drinking freely for some days, has recognized the fact that they are full of foulness; whoever has looked upon the bloated form of the inebriate has noted an increase of weight; whoever has looked upon the blood-cells of the intemperate, and remembered that "the blood thereof is the life thereof," has readily believed that an agent producing such effects upon these carriers of vitality is neither a nutrient nor a stimulant; and whoever has put a knife into the loaded tissues of the habitual drinker has found them too greatly devitalized for successful surgery.

Carbonate of ammonia is a universally recognized stimulant. No other agent so quickly relieves the toxic action of alcoholics. Does a stimulant antagonize a stimulant?

"Wine that maketh glad the heart of man is a mocker, and whose is deceived thereby is not wise." It maketh glad by making him oblivious to the conventionalities and realities of life, by making him regardless of pain, anxiety, and care, and heedless alike of the past, present and future. As one of the great interpreters of nature, out of an abundant experience, well said:

"He forgets his loves and debts,
And minds his griefs nae mair."

Nor was Burns the first to recognize that its action is only a burial beneath the Lethean wave. We read in the Proverbs of the wise man: "It is not for kings to drink wine, lest they drink and forget the law and pervert judgment. Give strong drink to him that is ready to perish, and let him drink and forget his poverty and remember his misery no more."

It is also on record, that one of the counselors of Darius, King of Persia, at the time of the second building of the Temple of Solomon, when discussing the power of wine, said: "It causeth all men to err that drink it; it maketh the mind of the king and the beggar to be all one, of the bondsman and the freeman, of the poor man and the rich, so that a man remembereth neither sorrow nor debt; it changeth and elevateth the heavy hearts of the miserable; it maketh a man forget his brethren and draw his sword against his best friends."

With rare exceptions, alcohol is given and taken for its lethal action, and not because it is a stimulant. Those who drink are already too much alive to their condition and surroundings. It is balm to the weary, wayworn and overburdened. When care and anxiety oppress, they drink and forget; when sorrows overwhelm, they drink and are soothed; when poverty depresses, they drink and are rich; when duties worry, dangers threaten, or conscience condemns, they drink and disregard, and at the social merry-making they drink that the soul may be oblivious to the sterner realities of life. The old toper well said, "Grog is equally good for heat or cold, for dry weather or wet," because it is an anæsthetic. Trelat says: "Drunkards are men who get drunk when they have a chance of drinking. Dipsomaniacs are people suffering from disease, who get drunk whenever they have an attack of their peculiar disorder."

Drunkenness, dipsomania, oinomania, alcoholism, call it what you will, excessive indulgence in strong drink is an evidence of moral weakness, moral cowardice. Drunkards are hypersensitives, who, instead of meeting the duties and dangers, the cares and anxieties, the pains and perplexities of life with the heroism of true and noble souls, and thus developing strength through resistance, dodge behind the intoxicating bowl, and every time they dodge they increase the temptation and weaken their powers of endurance and resistance, until "trilles light as air seem burdens too heavy to be borne." With increased temptation and lessened power of resistance they dodge again and again, until, moral, mental and physical wrecks, a disgrace to themselves and their kind, they dodge into untimely and disreputable graves.

The drink habit may derange every organ and function of the body, every faculty of the soul, while its lethal action conceals the injury until too late for repair; and its evils, unfortunately, do not end with the death of the drunkard. Its degenerations may be transmitted to the whole line of his posterity. We give an illustration taken from our own observation:

M. V., a pioneer in the Miami valley, Ohio, had a strong life, free from hereditary taint, but was a hard drinker from early manhood. He married a woman of good heredity, and five of their children reached adult life. The oldest son married a woman of good life, and they had three children; before the youngest grew to manhood the father died a drunkard. The two youngest children died in early life of consumption. The oldest son lived to mid-life, when he died of fibroid phthisis, leaving, from a strong and healthy wife, eight children, the majority of whom were consumptives.

The second son of M. V. was a drunkard. A wife of good heredity bore him three children, two of whom were healthy, the third scrofulous.

The oldest daughter married Dr. —, a good life. They had two sons and two daughters. The daughters and one son were consumptives, both sons intemperate.

The second daughter of M. V. married a farmer of good life, who died at middle

age of remittent fever, leaving twelve children, who grew to maturity with good habits, intelligent and moral. Of the seven sons, three were drunkards and four consumptives, while all the daughters died of phthisis.

An eminent medical teacher once remarked that no act of his life had caused greater regret than his counseling a dissolute inebriate to marry. From the marriage there were nine children. Three died in infancy; two were intemperate, one becoming a criminal; two were feeble-minded and hysterical; one was an epileptic, and one was insane. There were three grandchildren, all deficient in physical and mental vigor. These results obtained despite all the luxuries wealth could supply.

It is true, in these families the hereditary degenerations were unusually marked, but they illustrate the possibilities of alcoholics.

Call the action of alcohol stimulant or anæsthetic; believe, if you can, that an agent which cannot be changed by organic chemistry is a food, and capable of building up tissues, but whether stimulant, anæsthetic, or nutrient, what does sanitary science demand of any agent that produces its terrible results?

Alcohol not only causes physical disease and death, but as the possibilities of the spiritual man—the nobler self—lie in the possibilities of the physical life, through which it receives, correlates and manifests all impressions, it produces disease that tends to immorality and crime; disease that holds out the blossoms of hope until it has ripened the fruitage of despair;

"Unco' fou and unco' glorious,
O'er a' the ills of life victorious;"

disease that not only bears to drunkards' graves lives that should be the ornament and strength of the State, but transmits their degenerations to the whole line of their posterity, and if "this mortal *must* put on immortality," what of the immortality that has ripened through rum-besotted bodies?

When yellow fever or cholera are about to enter the State, the people and the statesmen gladly yield to the sanitarian authority, to institute any measure that will stay its progress. If small-pox or diphtheria appear in any home, he is expected to throw a cordon about it, and to institute such measures as will prevent its infecting the community. The sanitarian, the statesman or the citizen who would suggest that for a consideration, some judicious doctor be permitted to disseminate these diseases, that he may make an honest living by healing its victims, and bring money to the public coffers by paying for the privilege, would very properly be hooted from society; yet strange as it may seem, sanitarians have advised, politicians have argued, and judges have decided, that an agency a thousand times more destructive to life and to all that makes life dear, be allowed the freedom of the State; or that certain moral (?) citizens, in consideration of the moneys brought into the treasury of some incorporate village or city, be allowed a *high license* to dispense this mother of all diseases, this father of all abominations, to all the country-side. Is it not the duty of the State to require as positive measures for abating the greater, as the lesser evils? Shall it "strain at a gnat and swallow a camel"?

In Kansas, after the people, through a constitutional amendment, had decided upon prohibition, her legislators, instead of giving efficiency to the amendment, and protection to the people, by providing that only moral and educated physicians should diagnose disease and prescribe remedies, enacted a law that constitutes the most illiterate and debased citizen in the State a physician, and authorizes him to swear to his disease and his prescription; and if alcohol is the remedy, though the seductive agent caused and continued his malady, his oath makes him the peer of the most learned physician in the State, and secures the agent that is destroying his life, the peace of his family and the prosperity of the State—a law that encourages perjury, converts drug-stores into dram-shops, and druggists into

drunkards, and yet a law whose benefits, despite gross errors, is a prophecy of unmeasured blessings.

Whilst scientists do not pretend that the moderate use of alcoholics, when sufficiently dilute, and taken after meals, are productive of serious evils, all experience teaches that very few who use them habitually continue to use them moderately. Taken for their anæsthetic action, and tending to increase the cause for which they are taken, there is a constant demand for an increase of the remedy. So general is the sequent, neither age, sex, physical strength, intellectual culture nor morality barring the result, it may be enunciated as a law that moderate drinking tends to disease and drunkenness, and that certain happy-go-easy Rip Van Winkle temperaments are the predisposing, while special vocations, through their temptations, hardships, anxieties, and immoralities, are exciting causes of alcoholism.

While impressing the importance of developing that moral force that gives power to keep appetite and passion within due bounds, disseminating a knowledge of the temptations and tendencies of alcoholics, and teaching that they have no power to remove the causes of disease, to build up tissues or renew life, but produce opposite results, is good preventive medicine, good as far as it goes; when small-pox, yellow fever, or cholera invade a community, we not only hang out a warning-flag, but throw a cordon about them, and the law lends all its power to arrest their progress.

But, it is said, the law has no right to interfere with personal habits; no right to say what you shall or shall not eat or drink. No man has a right, civil or moral, to wrong either himself or his neighbor. In a free State the will of the people is the supreme law. They are the rulers and the ruled. The State is what they make it, and they are what it makes them. In their interest, individually and collectively, they demand laws that will defend their rights to "life, liberty, and the pursuit of happiness." They are the factors of the State, and the State is bound to protect its factors. Its wealth, its power, its character emanate from the citizen. If it is right to protect these, much more should it protect the source from which they spring, and those for whom they exist. The drink habit not only produces disease in those who drink and in their offspring, but it destroys the peace and happiness of families and neighborhoods, and robs the State of its character and strength, and hence must be condemned alike by physical, political, and moral science.

Another grave question arising from the use of intoxicating beverages is the mental condition and legal responsibility of the intoxicated. The law assumes that they are conscious of the character of their acts, and capable of sound judgment and self-control; yet the courts generally assert that they are not. They will not hear the testimony of a witness while inebriated, and do not fine him for contempt on account of his boisterous conduct, but send him to the cooler to be locked up until he is sober. Why should the law hold him responsible for acts committed in a condition in which the courts consider him irresponsible? Is the law, or the ruling of the court, right?

If the senses are disturbed, and the nerves rendered incapable of receiving or conveying correct impressions; if the brain is anæsthetized, semi-paralyzed, and rendered incapable of correcting or connecting impressions, whether from the action of alcohol or any other agent, is the man capable of sound judgment and correct action? If the courts have decided correctly that he should not testify while in that condition, can it rely upon impressions and observations made, or hold him responsible for acts committed, when in that condition? Under the influence of alcoholics, evils are magnified, prudence unappreciated, dangers disregarded; brave men cry over nothings, prudent men talk with their mouths, cowards laugh at the roar of cannons; the judgment is weakened, reason dethroned. The drunken man

is like a blind-and-deaf organist playing on a broken instrument; he neither appreciates its condition or its tones, but while the keys respond to his fingers believes all is well. If he neither realizes his surroundings nor the results of his acts, should he be held responsible at law? Are marriages contracted, properties exchanged or wills executed when intoxicated binding, or offenses committed criminal?

The toxic action of alcohol is so modified by idiosyncrasy, health, surroundings, and the amount consumed, that the only guide to correct conclusions is its known therapeutic action, its pathological expressions and functional results. An agent that interferes with nutrition and devitalizes the blood, that produces congestion of the brain and anæsthesia of the whole nervous system, rendering it incapable of correctly perceiving or correlating impressions, of understanding motives or comprehending actions, has destroyed mental and moral responsibility. In different degrees of intoxication and in different subjects we have all the forms of delusions and illusions, delirium and mania, imbecility and idiocy known to science. Though these conditions are usually transient, the molecules of the brain repeatedly impressed by any agent become more or less permanently changed, and diverted functional action must be the rule; but while it exists it is as real as that of any inmate of a madhouse. Though its usually transient character makes the law hesitate before deciding its victim irresponsible, so long as he does not appreciate the character of his acts or their consequences, does not realize his obligations to himself or society, whether the condition lasts an hour or a lifetime, while it exists there can be no legal responsibility.

But it is generally considered that all persons can avoid drunkenness, its sins and its crimes, and that persons intent on wrong-doing often drink that they may overcome cowardice and drown conscience. Power to resist and malice aforethought are not involved in our discussion, but whatever the power or the purpose, the fact remains that intoxication is insanity.

In deciding questions of insanity for legal purposes, the medical expert only goes into the history of causation as an aid to diagnosis. Whether it arises from ungoverned appetite or unbridled lust, from injury or disease, if it is insanity during its existence, responsibility ceases.

What is the duty of the State when a citizen voluntarily and habitually produces in himself a condition of irresponsible delirium, that makes him dangerous to both himself and those with whom he associates, an incubus to society, and an unconscious suicide, an infuriated assassin? Clearly to impose such restraints both upon him who drinks and him who makes him drunken as will secure ample protection.

Only mental weakness, surely akin to mental alienation, a defective power of self-control, can permit anyone to self-produce an irresponsible delirium, to destroy health and happiness, reputation and character, to squander property for that which brings only misery and crime, to turn home into hell, to produce premature death, and transmit to those dearer to the rational mind than life, degradation, disease and pauperism, or to walk in the way that leads to such a goal; and the State that sanctions or permits the sale of alcoholics, through which these results obtain, must provide asylums for the drunkard where he may be kept and treated *until cured* of his drunkenness, and bread and water and a rock-pile for those who lure him to destruction.

Sanitary science, laboring for the uplifting of humanity, though scarcely out of swaddling clothes, steps forth with the tread of a giant, and with the voice of a conqueror proclaims anew, "The years of man are three score and ten, and if by reason of strength, four score"—nay *five score, five times the length of his development period*. It has trampled beneath its feet most of the great destroyers that once devastated the earth, and now in the name of universal humanity demands that a traffic whose

tyranny rules the nations, producing unspeakable wickedness and unmeasured infamy, debasement and disease, shall cease, and that drunkenness, that relic of barbarism, that mother of crime, that parent of all disease, shall no longer corrupt, debauch and disease mankind.

The following was the last paper of this session :

WATER PURIFICATION.

BY COL. WILLIAM TWEEDDALE, C.E., OF TOPEKA.

The question of the determination of the quality of a water-supply suitable for potable uses, has become well understood. The chemical methods of basing its character on the inorganic and organic impurities it contains—not exceeding a certain number of grains per gallon, supplemented with a guess as to the nature of the organic impurities—and to their probable effect on the quality of the water according to the relative amounts of the carbonaceous and nitrogenous constituents of these impurities by the color of the ash of the residuum obtained by the evaporation of a portion of the water, are being superseded by methods of precision, by means of which, in addition to a determination of the nature and character of these impurities, there is also added the further condition: does the water contain disease germs? and if it does not, are the conditions such that if disease germs were introduced into the water would they develop into sources of disease?

The question as to whether or not the water contains disease germs has been determined by tracing the source of an epidemic to the washing of the clothing in the water-supply of a person having that specific disease, and to the fatal results of inoculating small animals with water containing the virus of these germs. On the above basis, sanitarians have defined polluted water to be that containing disease germs. When, however, it is considered that with the requisite conditions how very rapidly these germs develop, it would seem as if the definition, "polluted water," should be extended to all waters into which, if disease germs were introduced, they would develop. And as by far the larger portion of the water-supply of the State of Kansas is obtained from the drainage of alluvial soil, covered with vegetation, there is a liability at any time of these conditions being fulfilled, by the water becoming charged with this organic matter in a state of decomposition, requiring only to be inoculated with the germs of disease to produce the specific disease in those who use it dietically. From this it follows that the problem of water purification must be extended to a consideration of means for the removal of those conditions whenever they are found to exist.

It would seem needless to condemn a water-supply, unless a remedy is provided, for water must be obtained, and so long as the use of any particular water does not result in immediate death, its use will be persisted in. The recognition of this consideration by sanitarians has led to the demand for this high standard of purity of water-supply, which can only be provided in this section of country by the use of some system of water purification.

This demand has given rise to a class of water-purifiers who seek to attain the desired result by the use of self-cleansing filters, supplemented by the use of coagulants, usually alum. The effect produced by these filters is the removal of the suspended impurities, rendering the water clear. When it is considered that the necessary conditions requisite for the development of disease germs are that the organic matter be in a state of solution, and that the changing into a state of suspension preparatory to removal, requires the use of chemical reagents, it follows that unless provision is made for the use of such reagents, no system of filtration will be effected.

Preliminary to presenting a method for the purification of polluted water so as to render it potable—and all water in Kansas available in quantity and location for the supply of cities is liable at times to be polluted—it will be in order to state briefly the character and conditions of the impurities in water which render it polluted.

It is a matter of common knowledge that in certain localities of this country at certain seasons of the year, usually the fall and during periods of drouths, there is a prevalence of certain types of disease, designated as malarial. These, according to their character, are termed intermittent, remittent, typhoid, etc. These diseases are believed to be spontaneously developed, the effect of a certain poison; the result of the putrefactive decomposition of organic matter, introduced into the system by means of the foul air breathed, and polluted water drank. This poison is believed to be developed exteriorly to the person affected, and in no case communicated from one person to another.

There is also another class of diseases, as small-pox, scarlatina, measles, etc., termed miasmatic contagions. These have been shown by the researches of Pasteur and his co-laborers never to be spontaneously developed. They all have an origin—a leaven of living disease—an atom, living a life of its own—a microbe. The conditions for the reproduction of these disease germs are that they be deposited in decaying organic matter. This explains why in numerous instances persons living in the midst of filth, and in total disregard of proper sanitary requirements, apparently enjoy good health. The conditions for the reproduction of these diseases exist, but until the specific germ has been introduced into the system no disease results. As in the case of a person living over a powder magazine—there is perfect immunity from danger until such time as a spark is applied to the powder. So imperfect sewerage and unsanitary conditions are unsafe. Instances are on record where every condition of cleanliness has for a long period of time been disregarded without the manifestation of any special form of disease. When, however, it broke out and became epidemic, careful investigation showed that its development was preceded by the introduction into the source of the water-supply of the dejecta of persons suffering from that specific form of disease, in one instance of but a single individual.

Authorities are agreed that when the conditions above described are found to exist, either in the case of non-contagious or contagious diseases, that although an individual exposed to a disease which has become epidemic apparently escapes, that the effect is to so lower the tone of the system, as to make him unable to withstand the effect of other diseases not prevalent, but to which the individual in question has a predisposition. And while authorities are not agreed as to the specific nature of the poison, due to the decomposition of organic matter, which poison is the direct cause of the non-contagious diseases and the nidus for the development of the miasmatic contagious diseases, the conditions for the development of this poison are generally believed to be as follows:

1. A certain amount of vegetable matter either on the surface or in the substance of the soil, where the malarial poison is generated.

2. There must be a certain amount of moisture either on the surface or in the substance of the soil.

3. A certain average degree of temperature is indispensably requisite for its production. It cannot be developed below an average of 58° Fahr. for the 24 hours, and will not become epidemic unless the average temperature ranges as high as 65° Fahr. for the same length of time.

As regards the local conditions for producing malarial poison, they have been formulated as follows:

1. Marshes are especially favorable, but not invariably so. The generation of the poison varies with the amount of water in the marsh. When the water is abundant and the ground is covered to considerable depth, fevers are rare, but when they are partially dry with intervals of thin sheets of water exposed to the direct rays of the sun at a high temperature, malarial poison will be plentifully developed. When, however, heavy rains submerge the previously dry ground, the generation of the poison will be materially diminished or even entirely arrested.

It is found from observation that the breaking up of the soil of new land, the excavation for the construction of canals, railroads, foundations of large buildings, etc., by bringing to the surface decomposable vegetable matter, which, being acted upon by heat and moisture, causing decomposition, generates miasma.

From the above it will be evident that, regarding water as the medium for the transmission of disease germs from the decaying matter in which they have been developed to the human system, all waters obtained from streams, the source of whose supply is the drainage of alluvial soil, whether cultivated or inhabited by man, are liable at times to be unfit for potable use.

It was stated by the chemical experts in their testimony before the district court of Shawnee county in the case of *The Topeka Water Supply Company vs. The City of Potwin Place*, that the impurities in water which render it deleterious to health were those of an organic nature, and that the peculiarly distinguishing characteristic of this organic matter in water in its bearing on health was that it was oxydizable, and that to its possession of this propriety was due the self-purification of water in running streams; the organic matter being oxydized or burnt out by the air in contact with the surface of the water. This dogma has been very generally accepted without question by the leading water analysts and sanitarians of Kansas, and as the determination of the truth or falsity of this belief is of vital importance in the consideration of the character of any water-supply, whether for cities or for families, we will consider it somewhat at length, and with special regard to the established principle "experiments and observations, even when made with the greatest care and the very highest degree of skill, unless interpreted in accordance with established chemical and physical laws, are liable to lead to erroneous conclusions." By way of illustration, referring to chemistry, we learn that the principal elementary constituents of the simpler form of organic substances, as of a piece of wood, straw, etc., are oxygen, hydrogen, and carbon, and in the case of the more complex substances, as the flesh of animals, leguminous plants, etc., there is also nitrogen and sulphur.

The oxidation of any of these substances requires certain conditions. It may take place rapidly at a high temperature, as in the case of combustion, resulting in the combination of oxygen with carbon, forming carbonic acid gas, and of oxygen with hydrogen, forming water. These pass off as gas and vapor, leaving as ash the inorganic constituents. Or it may take place more slowly at a lower temperature, as in the case of decomposition, resulting also by the same combinations in the formation of carbonic acid gas and of water, leaving the inorganic constituents in form of humus, which in its nature and constituents is analogous to the ash of combustion.

In the oxidation by decomposition of the more complex forms of organic matter containing nitrogen, the breaking up of the bond which holds the several elements together by the combination of the carbon with the oxygen leaves the nitrogen in the nascent state, which allows of its combination with the hydrogen, forming ammonia, which is the last stage in which the elements exist as organic. Further oxidation in the presence of a base, as lime or soda, renders them inorganic by nitrification. As shown above, the requisite conditions for the decomposition of

organic matter are moisture, an average temperature of not less than 58° Fahr., and air. Decomposition will not take place in the absence of any one of these conditions. Wood wholly submerged in water even at a high temperature, being deprived of air, will last indefinitely. If in stagnant pools on the margin of a flowing stream, drift accumulations of organic matter become decomposed, malarial poison will be developed. If now, by reason of a freshet, this decomposed matter is carried into the stream, and an analysis is made of a portion of the water taken from the stream at near the source of this pollution, it will doubtless show a large amount of decomposed organic matter in the form of ammonia, completed decomposition, and of albuminoid ammonia, incompletely decomposed; while an analysis made of another portion of water, taken from the stream at a point remote from the source of pollution, will show a much less amount of these organic impurities, but which less amount would be due, not so much to purification, as to dilution and the cessation of decomposition.

As wood burned in pits without free access to air becomes charcoal, so, similarly, organic matter decomposed in the mud of streams without sufficient air, the carbon combining with the hydrogen forms the hydro-carbon compounds of the coal and coal-oil series. The English parliamentary commission on the pollution of rivers, with a view to the determination of to what extent polluted water in a running stream at a temperature of 64° Fah. would become purified after a flow of from eleven to thirteen miles, caused a careful examination of the water to be made, and found but that little effect was produced on the organic matter in solution in the water.

To test the matter more fully, remove all uncertainty, and eliminate from the problem the effect due to the variability of the composition of the water in the river at different times of the day, experiments were made by mixing filtered London sewage with water. It was then well agitated, and freshly exposed to light and air by siphoning in a slender stream from one vessel to another, falling each time through three feet of air. The mixture, which originally contained in 100,000 parts, by weight, .267 parts of organic carbon and .081 parts of organic nitrogen, was, after 36 hours' treatment, reduced to .251 parts of the first and .058 parts of the second; and after 192 hours' treatment, to .200 and .054 parts, respectively. The temperature of the water during the time of this experiment was 68° F. This reduction was, however, due more to the combination of the dissolved organic matter with the oxygen in the water than with that in the air. As these results were so very different from what had been expected by the testimony given on this subject based on the analysis of river water, a further experiment was made for a period of 168 hours, and the results obtained gave a further reduction of but 20 per cent.

The value of pure water for potable uses has been conclusively shown by its effect on the health of those who used it, as contrasted with that of those who used polluted water. The death-rate in London during the cholera epidemic was, in the case of those who used polluted water, 13 per 1,000 of the population, while in the case of those who used water procured from above the source of pollution it was but 3 $\frac{1}{10}$ per 1,000.

Sir Benj. Brodie, professor of chemistry at Oxford, in his testimony before the Rivers Pollution Commission, said: "I believe that an infinitesimally small quantity of decaying organic matter is susceptible of producing an injurious effect on health, and if even a large proportion of the organic matter in water was removed by oxidation the small quantity left might be injurious to health."

The physical condition of organic matters in water previous to their decomposition, is that of in suspension—the effect of decomposition is to change them to in a state of solution. Inorganic impurities in water, as earth salts, particularly in

the case of the carbonates, are but sparingly soluble. Added carbonic acid gas increases their solubility. To this cause is due the ordinary hardness of water—the carbonic acid gas being absorbed by the water from the air above the water. Clay and similar substances are ordinarily in a state of suspension. The same is true in the case of developed microbes of disease, which, according to Pasteur, are the specific sources of contagious diseases; while the spores of those microbes or disease germs, not being removable by filtration, may be regarded as in a state of solution. The removal of the substances in water, in a state of suspension, constitutes what is generally considered purification, and the means by which this is sought to be attained is filtration, supplemented in some instances by the use of a coagulant—usually alum—as is done in the use of the Hyatt filter. The claim made by the makers and vendors of this and other self-cleansing filters, that water thus treated is pure, is wholly unwarranted, as their action is simply mechanical. A moment's consideration will enable us to understand that any process for the removal of the impurities in water must be incomplete unless means are used to render them fit for removal—that is, before coagulation and filtration can be effected the impurities in a state of solution must first be changed to in suspension.

The impurities in water requiring removal are, as shown above, of two kinds: inorganic, the earth salts, for the most part in the form of carbonates, being held in solution by the excess or second equivalent of carbonic acid gas, and the organic matter, the results of the decomposition of vegetable or animal matter. The reagent for the changing of the inorganic impurities held in solution by the carbonic acid gas is an alkali, preferably by reason of its small cost, lime-water, which, by reason of its great affinity for carbonic acid gas, combines with the second equivalent of this gas, forming a carbonate of lime, and by the abstraction of the above second equivalent, reduces the earth salt also to a carbonate, which, being practically insoluble, both become changed to in a state of suspension.

The changing of organic substances in water from soluble to insoluble, requires the use of some reagent, preferably of a metallic nature, which by virtue of its possessing two states of oxidation allows the soluble organic substances in the water to act on it as a reducer; by combining with one atom of the oxygen of the insoluble metal, renders it soluble, while at the same time the heretofore soluble organic matter by combination with the atom of oxygen taken from the metal becomes insoluble. The now soluble iron moves in the liquid until such time as it comes into contact with another atom of oxygen; either from the air dissolved in the water, or in contact with the water, when it again becomes insoluble, and thus the action of the metal on the soluble organic matter is continuous so long as the supply of oxygen from supplied air and soluble organic matter exists in the water; this process is analogous to that given by mineralogists as an explanation of the formation of bog iron ore, mountains of which are found in Missouri.

The metal in general use for this purpose as being found best adapted, is iron in a finely-divided state. The discovery of this property of iron was due to the researches of Medlock, an English chemist, in the course of his examination of the character of the water-supply of Amsterdam, Holland.

In the form of spongy iron mixed with the sand of the filter-bed, it has been very extensively and successfully used by Bischof in the purification of the water-supply for cities in England.

For the purification of the water-supply of Antwerp, Anderson used iron-borings in a revolving horizontal cylinder, with ledges on the inside, the water entering and passing out through hollow gudgeons. The effect produced was to bring every particle of water into immediate and repeated contact with the iron. The water

thus treated was then passed through a sand filter, which removed the now insoluble organic matter.

As in this process no provision was made to supply air into the cylinder, when the oxygen in the air in solution in the water became exhausted, the action of the iron on the soluble organic matter ceased, as was manifested by in some instances only a partial purification being effected. The total destruction of the oxygen in the cylinder was shown by the extinguishing of a lighted candle inserted into the cylinder, and by, in some instances, partial explosion in the cylinder, showing the formation of a hydro-carbon. To obviate this want of oxygen, the writer devised an apparatus and a process in which the foregoing described reactions are recognized and provision made for carrying them out. The apparatus consists essentially of a vessel, tank, or reservoir, of any desired capacity, and an air pump or compressor.

Into the water to be purified a small quantity of specially prepared ferric iron is put; it is then thoroughly agitated by means of air forced into the water. This brings the soluble organic matter into contact with the iron, changing it to in suspension, and also supplying oxygen to the now ferrous iron, causing it to again become ferric. Lime-water slightly in excess of the requirement to neutralize the second equivalent of carbonic acid gas, is then added, and the agitation resumed. After allowing sufficient time for the reaction to be effected, the water is tested for excess of lime-water, manifested by showing alkalinity, and corrected by additions of normal water to neutrality.

To cause aggregation of the particles in suspension, and thus hasten precipitation, salts of alumina, in the form of alum and clay, may be added, and a final agitation given. On completion, the water is allowed to become quiescent, when the impurities, now in a state of suspension, including developed microbes of disease if present, are precipitated by sedimentation. When clear, the water is taken off from the top, by means of a floating pipe, clean, soft and free from developed microbes, and as decomposed organic matter in solution is the nucleus for the development of the spores of microbes. This water being sterile, their development will be impossible.

The Pasteur filter, with which you are familiar, is mechanical in its action. It is claimed for it that it removes disease germs. I have in these three test tubes specimens of Topeka hydrant-water—normal—passed through the Pasteur filter, and purified by the above-described process; from which it is seen that water purified by this process is equal in transparency to that passed through the Pasteur filter, while by reason of the removal of all soluble organic matter, it is absolutely sterile to disease germs. This process, being both chemical and mechanical, may be termed the chemico-physical process.

The following resolutions were offered, and unanimously adopted :

Resolved, That a vote of thanks be tendered to Prof. George T. Fairchild, and Dr. H. S. Roberts, for the very able manner in which they have presided over the deliberations of this, the Fifth Annual State Sanitary Convention; and to George F. Thompson, Esq., for his faithful attention and valuable report of the proceedings of the same as Secretary.

Resolved, That this convention extend its thanks to the press of the city for the space given to the proceedings of the convention, the program, and the call for the convention.

Resolved, That special thanks be tendered to Prof. Brown, Miss Dow, and the orchestra of the State Agricultural College, for the most excellent music furnished at different sessions of this convention, to the citizens of Manhattan, to the com-

mittees of arrangements and entertainments, and to the faculty and students of the State Agricultural College for the great interest they have shown, not only by their presence at its sessions, but their exhibition of sympathy for the cause of sanitation.

Dr. Redden presented the following communications in reference to holding the next State Sanitary Convention at Salina:

SALINA, KAS., Dec. 3, 1890.

To the Kansas State Board of Health—GENTLEMEN: At the regular meeting of the Commercial Club, of Salina, held on Tuesday evening, Dec. 2, 1890, it was unanimously voted to extend an invitation to the Kansas State Board of Health to hold its sanitary meeting in December, 1891, in Salina.

In accordance therewith, the invitation is hereby cordially extended to your honorable body.

Very respectfully,

R. P. CRAVENS, *President*.

I. H. GRAY, *Secretary*.

To the State Board of Health: The citizens of Salina, by the signatures here attached, respectfully unite and request that the next annual meeting of the Kansas Sanitary Convention, under the auspices of the State Board of Health, be held in the city of Salina, December, 1891.

E. P. CHITTENDEN, Rector of St. John's and parish.

E. R. TUTTLE, M. D.

C. B. KIRTLAND, Councilman.

J. H. DECKER, Secretary and Treasurer Salina Water Works Company.

L. O. THOROMAN, President Normal University.

ALONZO NORMAN, Natural Sciences.

H. J. PUTNAM.

WM. G. SIMCOOK.

F. B. BROWN, M. D.

M. JAY BROWN, M. D., President Hom. Med. Soc., of State of Kansas.

C. R. UNDERWOOD, Mayor of Salina.

TAYLOR MILLER, County Commissioner.

WM. W. CHAMPLIN, Professor of Mathematics, St. John's School.

A. G. GATES, Teacher of Commercial Branches, St. John's School.

N. D. TOBEX, M. D.

J. W. CROMLEY, M. D.

J. D. ENGLAND, M. D.

W. W. WATSON.

J. H. LOOKWOOD, Presiding Elder.

H. B. SCOTT, Dean Kansas Wesleyan University.

C. Y. ROOP, Superintendent City Schools.

W. D. STURBLE, Normal University.

JOHN O. WILSON, Attorney at Law.

J. G. MOHLER, Senator Thirty-first District.

WM. BISHOP, Clergyman.

R. A. LOVITT, County Attorney elect.

A. SCHUYLER, President Kansas Wesleyan University.

F. A. COOK, Professor of Latin and Greek, Kansas Wesleyan University.

WM. A. PHILLIPS, JR, Physician and Surgeon.

On motion, it was unanimously resolved that when this convention adjourns, it shall stand adjourned to meet in Salina, in December, 1891.

Brief remarks were then made by officers, delegates, and members of the convention.

The sessions of this convention will be remembered with pleasure by those who were privileged to attend.

A short time was very pleasantly spent in social conversation.

On motion, the convention then adjourned to meet in Salina, December, 1891.

AMERICAN PUBLIC HEALTH ASSOCIATION.

REPORT OF DELEGATES FROM THE KANSAS STATE BOARD OF HEALTH.

[NOTE.—The following report was received too late for insertion in its proper place in this volume.—SECRETARY.]

The eighteenth annual session of the American Public Health Association was begun December 16th, 1890, at Hibernian Hall, Charleston, S. C., at 10 A. M.; President Henry B. Baker, M. D., of Michigan, in the chair.

The President introduced Dr. Horlbeck, of the local committee of arrangements, who explained the program of exercises for the session.

There were only about fifty delegates present, but a large number of new members were elected, and after accepting an invitation to visit the city of Aiken, the regular work of the session began.

The first paper was, "The Federal District in the Republic of Mexico as a suitable residence for persons predisposed to tuberculous affections, and for the relief of pulmonary consumption," by Dr. Domingo Ozvananos, member of the Superior Board of Health of Mexico. The paper contained valuable information and statistics.

Next was read, "The Prevention of Tuberculosis; a century's supervision in Italy, under the influence of the preventive laws of the Kingdom of Naples, enacted in 1782," by L. F. Flick, of Philadelphia, of the State Board of Health.

A paper on "Ventilation and Impure Air, as prophylactic or causative of disease," was read by title by P. O. Remondino, M. D., president of the Board of Health of San Diego, California.

The papers on tuberculosis were discussed at some length by Drs. Gihon, Baker, Kemp, Flick, Rohe, Johnson, Brice, and others, and on motion of Dr. Gihon, of the U. S. Navy, a standing committee of five was appointed to formulate practical prophylactic measures for the prevention of the spread of tuberculosis, especially looking to the protection of the healthy members of the community from tuberculosis infection.

AFTERNOON SESSION—4 P. M.

The first paper was by Prof. José L. Gomez, of the Superior Board of Health of Mexico, on "Swine Red Disease" in Mexico. In answer to questions, the Professor responded that he thought it was the same as the "hog cholera" of the United States.

A paper by Dr. Chas. H. Shepard, of Brooklyn, was then read by Dr.

Bailey, of Kentucky, on "Sanitary Advantages of the Turkish Bath," giving its history from the earliest times.

Dr. F. P. Venable, of the University of North Carolina, read a paper on "Chemical Disinfection." This paper was very thoroughly discussed.

On Tuesday evening a grand reception was given to the Association at the Grand Opera House by the citizens of Charleston. Owing to the illness of the mayor, Dr. Horlbech, of the local committee of arrangements, called the meeting to order, and after prayer, Dr. J. S. Buist was introduced, and made the address of welcome. President Henry B. Baker, of Michigan, returned thanks for the cordial welcome, and delivered the annual address—an able review of the present general standing of the sanitary question.

He was followed by Mr. I. P. K. Bryan, who eulogized the objects and work of the Association, etc.

Rev. Dr. Vedder made the closing address, and held the close attention of his audience by eloquent remarks, full of wit and humor.

SECOND DAY—MORNING SESSION.

Dr. Sam. Ashman, health officer of Cleveland, Ohio, presented a report on diphtheria. He said there were 40,000 cases yearly in the United States and Canada, with 10,000 deaths, and really no organized opposition to its spread. Answers to letters sent out by him show that 93 per cent. of observers believe it due to a *specific cause*. The report and the necessities of the case—what ought to be done—were thoroughly discussed.

Major Smart, chairman of committee on "Pollution of Water Supplies," asked more time. Granted.

Dr. Samuel W. Abbott, Secretary of the Massachusetts State Board of Health, read a paper, "What constitutes a filth disease?" He was entirely familiar with the question. Small pox, consumption, yellow fever, typhoid fever, were enumerated, the latter being the *chief* filth disease.

Dr. Geo. T. Kemp, Director of Physiology and Experimental Therapeutics at the Hoagland Laboratory, Brooklyn, N. Y., read a paper on "Some original observations on the value of microscopical, spectroscopical and chemical examination of black vomit, as an aid to health officers in distinguishing yellow fever from malarial fever." This paper was of great value.

Dr. J. S. Buist then explained the aims of the inventor of "car ventilation;" described the invention itself, the importance of the subject, and said the trip that afternoon would be for the purpose of seeing the practical working of the invention.

Prof. Daniels was made chairman of a committee to consider the subject of "car ventilation in reference to hygienic and sanitary laws."

The afternoon of Wednesday was chiefly spent in an excursion to the suburbs, inspecting the working of the invention of the "Emerson car ventilation," as explained by Dr. J. S. Buist for the company.

WEDNESDAY EVENING.

Dr. Jos. H. Raymond, of Brooklyn, New York, offered two papers, "Sanitary Improvement of Stagnant Lakes Near the Sea Shore," and "Treatment of Sewage by Precipitation and Saturation," illustrated by stereopticon pictures.

The next paper was by Dr. A. U. Bell, of Brooklyn, "The Relation of the Mechanical Arts to Preventive Medicine," illustrated by the artesian wells and tidal drains of Charleston. This was a minute history of these wells and drains.

Mr. L. J. Barbot presented an elaborate paper on "The Tidal Drain System of Charleston." Had studied the subject for years, and gave an exhaustive account. Was made the special order for the next morning.

THIRD DAY—MORNING SESSION.

Dr. Durgin presented a paper on "Immigrant Ships," showing constant danger of importation of contagious and infectious diseases. He recommended that only competent surgeons be appointed; one to every six hundred immigrants, with power to enforce the sanitary rules of the United States Government.

In the same connection was a paper by Dr. Montizambert, quarantine officer of Canada, on vaccinal protection of passengers from small-pox. He offered a resolution that all unprotected persons be vaccinated at the port of departure. Adopted.

Dr. Plunket, of Tennessee, offered a resolution urging all health officers at quarantine ports to exercise special care for the exclusion of cholera, the next year, and health officers of inland cities take special pains to secure the greatest cleanliness of their cities. Adopted.

The Association on Thursday made an excursion of great interest, to quarantine at James Island, three miles from Charleston. The plant is similar to that of the Holt system at New Orleans, and is thoroughly equipped for disinfecting any vessel.

FOURTH DAY.

Friday, the last day, was taken up with hearing reports of committees, electing officers, etc. The officers elected were as follows:

President, Dr. Montizambert, of Quebec; first vice president, Dr. Thomas F. Wood, Wilmington; second vice president, Dr. H. B. Horlbeck, Charleston; treasurer, Dr. I. B. Lindsley, Nashville; secretary, Dr. Irving A. Watson, Concord, New Hampshire.

The following committees were continued: Major Charles Smart, U. S. A., Special Pollution of Water Supplies; Prof. Delos Fall, of Michigan, Disposal of Garbage and Refuse; Dr. H. B. Baker, of Michigan, Forms of Statistics; Dr. Sternberg, U. S. A., Protective Inoculation in Infective Diseases; Dr. H. P. Walcott, of Massachusetts, National Health Legislation,

with Dr. Watson, secretary, and all of advisory council; Dr. Sam H. Durgin, of Boston, Sanitary and Medical Service on Immigrant Ships; Dr. G. C. Ashman, Cleveland, Cause and Prevention of Diphtheria; Dr. Jerome Walker, Brooklyn, Cause and Prevention of Infant Mortality; Dr. Fred Montizambert, Quebec, on Incorporation; Dr. J. N. McCormack, Bowling Green, Ky., on Restriction and Prevention of Tuberculosis.

A special committee, with Dr. John A. Rauch, of Illinois, as chairman, was appointed to inquire into the practicability of undertaking to demonstrate a recognition of the work of this Association at the World's Fair. No better or more competent man than Dr. Rauch could be found to do this work.

The next meeting of the Association will be held at Kansas City, Mo.

The Association then adjourned *sine die*, and a large number of the members went on the excursion to Aiken, the well-known health resort of the South, about 125 miles from Charleston, and 15 miles from Augusta, Ga. It is 565 feet above sea level, with a very dry and bracing air. Mean temperature in winter about 50°, with range from 12° to 15°. These characteristics make it a very pleasant and agreeable place for Northern invalids.

D. C. JONES, M. D.

FRANK SWALLOW, M. D.

INDEX.

A.

| | |
|---|-----|
| Abstracts of the proceedings of quarterly sessions..... | 5 |
| Abstracts of quarterly reports..... | 14 |
| American Public Health Association, delegates to..... | 9 |
| Analysis of a sample of water from Leavenworth..... | 27 |
| Analysis of a sample of water from Fredonia..... | 32 |
| Analysis of a sample of water from Hutchinson..... | 33 |
| Analysis of a sample of water from Winfield..... | 34 |
| Ancient Irish gripe..... | 36 |
| Analysis of samples of water from Hutchinson..... | 46 |
| Anderson, Dr. Alice G. H., communication from..... | 23 |
| American Public Health Association, report of delegates from the Kansas State Board of Health to the..... | 253 |

B.

| | |
|--|-----|
| Bacteria and disease..... | 199 |
| Births, synopsis of the annual reports, by counties: | |
| Atchison..... | 97 |
| Butler..... | 97 |
| Brown..... | 97 |
| Clay..... | 98 |
| Comanche..... | 98 |
| Crawford..... | 98 |
| Decatur..... | 98 |
| Dickinson..... | 99 |
| Doniphan..... | 99 |
| Ellis..... | 99 |
| Ellsworth..... | 99 |
| Finney..... | 99 |
| Franklin..... | 100 |
| Garfield..... | 100 |
| Geary..... | 100 |
| Greeley..... | 100 |
| Greenwood..... | 101 |
| Harvey..... | 101 |
| Hodgeman..... | 101 |
| Jackson..... | 101 |
| Jefferson..... | 101 |
| Jewell..... | 101 |
| Johnson..... | 102 |
| Kearny..... | 102 |
| Kingman..... | 102 |
| Labette..... | 102 |
| Lane..... | 103 |
| Leavenworth..... | 103 |
| Lyon..... | 103 |
| Marion..... | 103 |
| McPherson..... | 103 |
| Meade..... | 104 |
| Miami..... | 104 |
| Montgomery..... | 104 |
| Nemaha..... | 104 |
| Ness..... | 104 |

Births—concluded:

| | |
|---|-----|
| Osage..... | 105 |
| Osborne..... | 105 |
| Phillips..... | 106 |
| Pottawatomie..... | 106 |
| Rawlins..... | 106 |
| Republic..... | 106 |
| Shawnee..... | 106 |
| Sheridan..... | 107 |
| Sherman..... | 107 |
| Stanton..... | 107 |
| Thomas..... | 107 |
| Wabaunsee..... | 108 |
| Wilson..... | 108 |
| Wyandotte..... | 108 |
| Books and publications, list of..... | 68 |
| Brown county, Annual Report from County Health Officer of..... | 74 |
| Butler county, Annual Report from County Health Officer of..... | 75 |

C.

| | |
|---|-----|
| Care of sick-room..... | 65 |
| Changes of county health officers..... | 29 |
| Changes of members of the Board since 1885..... | 22 |
| Chase county, Annual Report from County Health Officer of..... | 75 |
| Checking the spread of disease..... | 65 |
| Cholera in the East, in 1890..... | 37 |
| Cholera in Japan, 1884 to 1887..... | 37 |
| Cholera in Persia..... | 20 |
| Clay county, communication from County Health Officer of..... | 26 |
| Clay county, Annual Report from County Health Officer of..... | 75 |
| Cloud county, Annual Report from County Health Officer of..... | 76 |
| Coffey county, Annual Report from County Health Officer of..... | 76 |
| Comanche county, Annual Report from County Health Officer of..... | 77 |
| Committee on codification of State laws..... | 165 |
| Communication from the Secretary of the Health Board of the City of Mexico..... | 6 |
| Communication in reference to Sixth Annual Session of National Conference of State Boards of Health..... | 5 |
| Communication in reference to transportation of corpses..... | 7 |
| Communication as to the pollution of the Kaw river at Kansas City, Kas., by sewage..... | 9 |
| Communication in reference to supposed cholera in Russia..... | 20 |
| Communication in reference to interest and progress in sanitary matters..... | 25 |
| Communication from Secretary of the Connecticut State Board of Health..... | 26 |
| Communication from Secretary of the Pennsylvania State Board of Health..... | 26 |
| Communication from Dr. Bidwell, of Leavenworth..... | 27 |
| Communication from Secretary of the Maine State Board of Health..... | 30 |
| Communications in reference to Fifth Annual Report..... | 31 |
| Communication from the Mayor and Council of Fredonia..... | 32 |
| Communication from County Health Officer of Wilson county..... | 31 |
| Conference of State Boards of Health, communication from Dr. Young in reference to the time of meetings of the..... | 165 |
| Contagious diseases, form for communication of..... | 65 |
| Contents..... | v |
| County Health Officers, list of..... | iii |
| Crawford county, Annual Report from County Health Officer of..... | 77 |

D.

Deaths—Synopsis of annual report, by counties:

| | |
|----------------|-----|
| Atchison..... | 109 |
| Butler..... | 110 |
| Clay..... | 110 |
| Coffey..... | 110 |
| Comanche..... | 110 |
| Crawford..... | 110 |
| Decatur..... | 111 |
| Ellsworth..... | 111 |
| Finney..... | 111 |

Deaths — *concluded* :

| | |
|---|-----|
| Ford | 111 |
| Franklin | 112 |
| Garfield | 112 |
| Geary | 112 |
| Gray | 112 |
| Greeley | 112 |
| Greenwood | 113 |
| Harvey | 113 |
| Hodgeman | 113 |
| Jefferson | 113 |
| Jewell | 113 |
| Johnson | 114 |
| Kearny | 114 |
| Kingman | 114 |
| Labette | 114 |
| Lane | 115 |
| Leavenworth | 115 |
| Lyon | 115 |
| Marion | 115 |
| McPherson | 116 |
| Meade | 116 |
| Miami | 116 |
| Montgomery | 116 |
| Nemaha | 116 |
| Ness | 117 |
| Osage | 117 |
| Osborne | 117 |
| Phillips | 118 |
| Pottawatomie | 118 |
| Rawlins | 118 |
| Reno | 118 |
| Shawnee | 118 |
| Sheridan | 119 |
| Sherman | 119 |
| Stanton | 119 |
| Thomas | 119 |
| Wabaunsee | 120 |
| Wilson | 120 |
| Decatur county, Annual Report from the County Health Officer of | 78 |
| Disinfection for contagious diseases | 154 |
| Dissemination of sanitary knowledge | 176 |
| Douglas county, Annual Report from the County Health Officer of | 78 |
| Drinking-water, the examination of | 221 |

E.

| | |
|---|-----|
| Ellis county, Annual Report from County Health Officer of | 78 |
| Executive powers of State Boards of Health | 157 |

F.

| | |
|--|----|
| Financial statement | 67 |
| Ford county, Annual Report from County Health Officer of | 79 |

G.

| | |
|--|----|
| Glanders in man, report of a case of | 50 |
| Garfield county, Annual Report from County Health Officer of | 79 |
| Geary county, Annual Report from County Health Officer of | 79 |
| Greeley county, Annual Report from County Health Officer of | 80 |

H.

| | |
|--|-----|
| Habit on the body, the influence of | 62 |
| Harvey county, Annual Report from County Health Officer of | 80 |
| Hygiene, instructions in | 17 |
| Hygiene, how most effectually to promote the principle and practice of | 146 |
| Hygiene of the school, The | 216 |
| Hodgeman county, Annual Report from County Health Officer of | 80 |

I.

| | |
|--|-----|
| Indiana, sanitary condition of school-houses in..... | 18 |
| Infant-feeding, the popular demand for..... | 190 |
| Infectious diseases, practical measures for controlling the spread of..... | 64 |
| Influence of habit on the body..... | 62 |
| International Congress of Medicine, at Berlin, Germany, delegate to..... | 8 |
| Intoxicants and health..... | 208 |

J.

| | |
|--|----|
| Johnson county, Annual Report from the County Health Officer of..... | 50 |
|--|----|

K.

| | |
|---|----|
| Kansas State Board of Health Reports, letters of commendation of..... | 31 |
| Kearny county, Annual Report from County Health Officer of..... | 81 |
| Kingman county, Annual Report from County Health Officer of..... | 31 |

L.

| | |
|--|-----|
| Labette county, Annual Report from County Health Officer of..... | 82 |
| La grippe, form for reporting epidemics of..... | 25 |
| Lane county, Annual Report from County Health Officer of..... | 81 |
| Leprosy, report of the committee on..... | 149 |
| Library, number of volumes during the year added to..... | 47 |
| Light in the school-room..... | 186 |
| Linn county, Annual Report from County Health Officer of..... | 84 |
| Logan county, Annual Report from County Health Officer of..... | 84 |
| Lyon county, Annual Report from County Health Officer of..... | 85 |

M.

| | |
|---|----|
| Marion county, Annual Report from County Health Officer of..... | 85 |
|---|----|

Marriages, synopsis of annual reports, by counties:

| | |
|-------------------|-----|
| Brown..... | 121 |
| Clay..... | 121 |
| Comanche..... | 121 |
| Decatur..... | 121 |
| Ellis..... | 122 |
| Ellsworth..... | 122 |
| Finney..... | 122 |
| Ford..... | 122 |
| Garfield..... | 122 |
| Geary..... | 122 |
| Greenwood..... | 122 |
| Groesbeck..... | 122 |
| Harvey..... | 123 |
| Jewell..... | 123 |
| Johnson..... | 123 |
| Kearny..... | 123 |
| Kingman..... | 123 |
| Labette..... | 123 |
| Lane..... | 123 |
| Marion..... | 124 |
| McPherson..... | 124 |
| Meade..... | 124 |
| Miami..... | 124 |
| Montgomery..... | 124 |
| Nemaha..... | 124 |
| Neosho..... | 124 |
| Osborne..... | 125 |
| Phillips..... | 125 |
| Pottawatomie..... | 125 |
| Rawlins..... | 125 |
| Reino..... | 125 |
| Rosell..... | 125 |
| Sheridan..... | 125 |
| Sherman..... | 126 |
| Stanton..... | 126 |
| Thomas..... | 126 |
| Wilson..... | 126 |

| | |
|---|-----|
| McPherson county, Annual Report from County Health Officer of..... | 85 |
| Meade county, Annual Report from County Health Officer of..... | 87 |
| Members of the State Board of Health, terms of office..... | 3 |
| Meteorological..... | 127 |
| Miami county, Annual Report from County Health Officer of..... | 87 |
| Montgomery county, Annual Report from County Health Officer of..... | 87 |

N.

| | |
|---|-----|
| National Conference State Boards of Health, delegates to..... | 5 |
| National Conference State Boards of Health, reports of delegates to..... | 51 |
| National Conference State Boards of Health, synopsis of the proceedings of..... | 143 |
| List of delegates to..... | 143 |
| Address of the President..... | 143 |
| Nemaha county, Annual Report from County Health Officer of..... | 88 |
| Ness county, Annual Report from County Health Officer of..... | 88 |
| Nuisances, communications in reference to public..... | 40 |
| Nuisances—what they are, and how to abate them..... | 197 |

O.

| | |
|--|----|
| Osborne county, Annual Report from County Health Officer of..... | 88 |
| Ottawa county, Annual Report from County Health Officer of..... | 89 |

P.

| | |
|---|-----|
| Phillips county, Annual Report from County Health Officer of..... | 89 |
| Pottawatomie county, Annual Report from County Health Officer of..... | 89 |
| Pratt county, Annual Report from County Health Officer of..... | 90 |
| Preservation of the forests as a national sanitary need..... | 160 |
| Prevention of tuberculosis..... | 232 |
| Proper education of woman, The..... | 193 |
| Property statement..... | 67 |
| Public-health knowledge, methods of disseminating..... | 145 |
| Purity of the well-waters of Kansas..... | 6 |

Q.

| | |
|--|----|
| Qualifications required to practice medicine in Missouri, communication in reference to..... | 42 |
| Quarantine against the island of Sumatra by the Governor of Queensland, Australia..... | 19 |

R.

| | |
|---|-----|
| Rawlins county, Annual Report from County Health Officer of..... | 90 |
| Reno county, Annual Report from County Health Officer of..... | 91 |
| Relation of alcoholies to preventive and state medicine, The..... | 236 |
| Report of the Board, preface to the | vii |
| Resolutions from the State Board of California..... | 165 |
| Resolutions prepared by the Committee on Forestry..... | 166 |
| Resolutions adopted by the National Conference of State Boards of Health..... | 44 |
| Resolutions as to the holding of the regular quarterly meetings of State Board of Health..... | 6 |
| Rooks county, Annual Report from County Health Officer of..... | 92 |
| Russell county, Annual Report from County Health Officer of..... | 92 |

S.

| | |
|---|-----|
| Sanitation, its object, scope, and legislation | 203 |
| Sanitary budget and household gems, The..... | 175 |
| Sanitation in relation to crime..... | 224 |
| Sanitary condition throughout the State..... | 28 |
| Scarlet fever, restriction and prevention of, communications as to their value..... | 42 |
| Secretary of the State Board of Health, his resignation, and cause therefor..... | 13 |
| Secretary's Report..... | 3 |
| Shawnee county, Annual Report from County Health Officer of..... | 93 |
| Sherman county, Annual Report from County Health Officer of..... | 93 |
| Sheridan county, Annual Report from County Health Officer of..... | 94 |
| Small-pox in Topeka, special reports on..... | 49 |
| Small-pox in Kansas, special reports on..... | 22 |

| | |
|---|-----|
| Small-pox in Michigan, Minnesota, Connecticut, and Illinois, interstate notification in reference to..... | 15 |
| Standing committees..... | 3 |
| Stanton county, Annual Report from County Health Officer of..... | 94 |
| State Board of Health, The works and wants of a..... | 233 |
| State Board of Health Reports, communication in reference to..... | 22 |
| State charitable institutions, appointment of committees to visit..... | 60 |
| State charitable institutions, reports of special committees appointed to visit..... | 60 |
| State Sanitary Convention, invitation and program for the Fifth Annual..... | |
| Proceedings, addresses and discussions of the..... | |
| Address of welcome..... | |
| Officers and committees of the..... | 171 |
| Response to the address of welcome..... | 174 |
| State Sanitary Convention, resolutions at Sixth Annual Convention..... | 250 |
| State Sanitary Convention, time and place for holding Sixth Annual Session..... | 251 |
| Store-room food..... | 213 |
| Summary of weather reports..... | 139 |

T.

| | |
|--|-----|
| Thomas county, Annual Report from County Health Officer of..... | 94 |
| Toronto Observatory, summary of calculations, made some years ago, of the rainfall at the..... | 161 |
| Tuberculosis, prevention of..... | 18 |
| Typhoid fever, measures as to the prevention of..... | 19 |

V.

Vital Statistics—

| | |
|----------------------------------|-----|
| Tabulated list of births..... | 96 |
| Tabulated list of deaths..... | 109 |
| Tabulated list of marriages..... | 120 |

W.

| | |
|---|-----|
| Wabauunsee county, Annual Report from County Health Officer of..... | 94 |
| Water-supply of Manhattan, The..... | 174 |
| Waters, how to prevent contamination of potable..... | 156 |
| Water purification..... | 245 |
| Weather reports— | |
| For January, 1890..... | 127 |
| For February, 1890..... | 128 |
| For March, 1890..... | 129 |
| For April, 1890..... | 130 |
| For May, 1890..... | 131 |
| For June, 1890..... | 132 |
| For July, 1890..... | 133 |
| For August, 1890..... | 134 |
| For September, 1890..... | 135 |
| For October, 1890..... | 136 |
| For November, 1890..... | 137 |
| For December, 1890..... | 138 |

Y.

| | |
|--------------------------------------|-----|
| Yellow fever, the quarantine of..... | 148 |
|--------------------------------------|-----|

Z.

| | |
|---|-----|
| Zymotic diseases, the hygienic prevention of..... | 227 |
|---|-----|



